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Thesis

HEGELIAN AND SYLLOGISTIC LOGIC COMPARED

by

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INTRODUCTION

Statement of the problem. The problem of this thesis is to draw a comparison between formal logic, as formulated by Aristotle, and the logic of Hegel. It is to be a comparison of the Hegelian logic of development as over against the static nature of Aristotelian logic. We are not, however, attempting to deal critically with either logical system as this would be a task far beyond the scope of this thesis. The thesis is to be a comparative study of both logical systems in so far as their general presuppositions and conclusions are concerned.

The thesis, in the main, will concern itself with those areas in Hegelian logic which either: (1) offer a principle in opposition to those of Aristotelian logic; (2) adopt an Aristotelian principle; or (3) present an advance over an Aristotelian principle while using that principle as a basis for the reasoning employed and the advance made. Such questions as, What is the relation of Hegelian and Aristotelian logic? and, Does Hegelian logic furnish us with any new insight or principle by which we may attain truth? will be kept in mind throughout the study.

It is frankly admitted that the main interest in this study is to acquire an understanding of Hegel's logic in its applications to the science of reasoning. Interest in this subject was aroused because of the fact that Hegel's logic is at once said to be discouragingly difficult to comprehend and at the same time to have had an immeasurable in-

fluence upon the thinking of subsequent philosophers. The general estimate of Hegel's logic has, in general, exhibited this contradictory character. The difficulty seems to lie in the metaphysical implications of Hegel's thought. But the question has arisen, If Hegel's logic is as difficult as it is claimed to be and yet has had such a profound influence upon the thinking of those who followed him, are there not some outstanding principles which Hegel has demonstrated and which can be understood as valid apart from the general metaphysical system of which they are a part? If so, what is the relationship of these principles to those that are commonly taught in the science of formal logic? The resulting study is an attempt to answer some of these questions.

Loewenberg, in his Hegel Selections, opens his introduction in these words:

> Hegel is a philosopher whom one neglects at one's peril. His learning was vast, his discernment keen, his penetration deep. He had a synoptic mind, and his vision was synoptic. ...Hegel thought he had provided a system sufficiently spacious to include in it in sublimated form all the typical ways of responding to the world and all the typical categories by which to describe it. The truth is the whole, he said, and his philosophy, he claimed, was the whole truth. ...The very extravagance with which Hegel proclaimed the truth of his philosophy is a challenge to the prevailing neglect of it. The tenets associated with his name, though their pretentiousness be offensive, may well be worth our knowing.[1]

Of all the great philosophers of history, Hegel is perhaps the most criticized, and for the most varying of reasons. The charge is

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1. Loewenberg, HS, ix.

brought against him that he is dense, and therefore difficult to understand. Such a criticism tells one only the extent of the critic's understanding or lack of it, and very little about Hegel. Others do not like Hegel's Absolute; others shy away from the union of logic and metaphysics. Hegel has been championed on the one hand by those who believed him to be a champion of Christianity; he has been criticized, on the other hand, by those Christians who have charged that his philosophy leads to atheism, or at the very least, to pantheism. Hegel has been accused of destroying the individuality of the human person, and of exalting the Prussian State. He has been accused of being entirely too abstract and rationalistic and his philosophy too far removed from the facts of everyday experience. All such charges and accusations show a lack of understanding of Hegel on the part of his critics, for when his philosophy is rightly understood, it is seen to be rooted in experience, and to exalt personality.

The basis of many of these criticisms lies in the fact that Hegel is typically German, and his philosophy is expressed in characteristically difficult language. In addition, Hegel constantly uses terms in current use with new meanings attached to them; consequently part of the preparation of anyone who would study him is a mastering of his peculiar terminology.[2] This, in itself, has occasioned much criticism, but such criticism has no more validity than a criticism of the terminology of modern scientific medicine would have. No science or philosophy can hope to make a searching study of experience without the use of termin-

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2. Cf. Royce's important article on Hegelian terminology in Baldwin, DPP, 454-464.

ology that will be unambiguous and will carry the meaning that is intended, and no other.

It is to be admitted that Hegel is difficult, and that his language is a barrier to an understanding of him; but the real difficulty lies in the fact that his approach to the reality of life and the world is so searching and comprehensive in its scope that it is disturbing to people who are so bound within ordinary habits of mind that they are content if they can express themselves with a minor degree of exactitude. Wallace has summed up the real issue in his Prolegomena to Hegel's Logic, in which he says,

> Perhaps the main hindrance in the way of clear vision is the contrast which the Hegelian philosophy offers to our ordinary habits of mind. Generally speaking, we rest contented if we can get tolerably near our object, and form a general picture of it to set before ourselves. ...For most of us the place of exact thought is supplied by metaphors and pictures, by mental images, and figures generalized from the senses. And thus it happens that, when we come upon a single precise and definite statement, neither exceeding nor falling short in its meaning, we are thrown out of our reckoning.[3]

The main difficulty, then, in our understanding of Hegel comes, not from the density of the man himself, but from our ordinary habits of shallow and superficial thinking. And resentment is born when we are forced to explain ideas and conceptions which lie outside the pale of colorless and inadequate notions. In the same passage with the above, Wallace refers to Rosenkranz's Hegels Leben in which Hegel himself is quoted as saying, "The condemnation which a great man lays upon the

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3. Wallace, PSHP, 2-3. Cf. Hegel, Encyclopädie (Wallace), 7-8.

world, is to force it to explain him".[4] It is hoped that a comparison of Hegel's logic with that of Aristotle will in some measure help us to explain him.

The literature. Research has disclosed that, as far as we were able to determine, there is no work specifically designed to draw the comparisons we are suggesting. Im many of the standard works on Hegel there are, of course, many references to such comparisons. We have therefore not relied upon any one work as a basis for this thesis, but have appealed to the standard works on both Hegel and Aristotle. Much reliance has been placed upon the Organon of Aristotle and upon the Encyclopädie of Hegel, since the comparisons we are looking for are best found in the primary works of these men apart from the interpretations which usually accompany commentaries upon them.

The method. The method followed is clearly indicated by the structure of the thesis. We begin with a historical survey of logic in order that we may determine the origin and development of the science of logic, and also the relationship of the distinctively Aristotelian logic to logic as it has been developed through the history of philosophic thought. The treatment of the history of logic makes necessary some reference to its modern applications and methods, and this has been done with a view toward presenting general impressions rather than comprehensive

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4. Wallace, PSHP, 1.

expositions. The place of Hegel's logic in the general scheme of the history of logic is also noted.

Chapter two deals with Aristotelian logic, both with reference to its origin and nature, and also with reference to its main problem and consequent limitations. Effort is made to give a clear account of its general presuppositions and its main principles.

Chapters three and four deal with Hegelian logic in a similar vein. Hegel's logic is examined with reference to its historical connections and significance. This is followed by an examination of its general presuppositions and main principles.

Chapter five is a comparison and contrast of the two types of logic, based upon the studies made in the preceding chapters.

At this point it is necessary to call attention to a tendency which develops as we go deeper into the study: the tendency to confuse the logic as formulated by Aristotle with the more modern adaptations of it, as, for example, symbolic logic. No attempt is made to deal with symbolic or mathematical logic other than to include it in the historical survey of logic. But it should be emphasized that the formal logic of Aristotle became formalized and divorced from reality by revisions made of it after Aristotle's death. The comparison before us is based upon the logic of Aristotle, not upon modern adaptations of it. This fact needs to be kept in mind, especially in dealing with the criticisms that Hegel levels against formal logic, for often quite evidently he has in mind the more modern adaptations of it, and all of his criticisms do not necessarily apply to Aristotle's formulation of it.

CHAPTER ONE

THE HISTORICAL DEVELOPMENT OF LOGIC

Aristotle is famous in the history of human thought because he attempted to organize and systematize all of the various branches of knowledge which his day and age possessed. His achievements in such an undertaking are, to say the least, astounding. He exhibits a depth of thought, a breadth of knowledge, and an analytic ability that probably has never been equaled since his day. Along with his work in the various sciences, it is not unnatural that his mind should turn toward the nature of thought itself, and toward those processes of thought which everyone must use if he is to arrive at truth. Consequently, Aristotle turned his attention toward what today is known as formal logic.

Before examining Aristotle's contribution to the science of logic, it is well to recognize that Aristotle was not the first thinker to turn his attention toward the problem of clarifying thought. Logic arose, at least for the western world, in the golden age of Greek speculation, which culminated in Plato and Aristotle. According to Wolf and Blunt:

> There is an Indian logic, it is true, but its priority is still disputed. In any case, no influence upon Greek thought can be shown. The movement which ends in the logic of Aristotle is self-contained.[1]

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1. Enc. Brit., XIV, 316. In general, the survey of the history of logic which follows is based upon this article (307-330).

Logic needs as its presuppositions that thought should distinguish itself from things and from sense, that the problem of validity should be recognized as properly belonging to the field of thought itself, and that analysis of the structure of thought should be recognized as the one way of solution. The first stage of Greek philosophy possessed only the potentiality or germ of logic. The early nature-philosophers Thales, Anaximander, and Anaximenes (600-528 B.C.), in seeking for a single, material principle underlying the multiplicity of phenomena, raised the problem of the one and the many; and any endeavor to find the solution to this problem must eventually lead to logic. But only from the point of view of later speculation can these early philosophers be said to have sought to determine the predicates of reality. A further step in the movement toward a definition of logic was necessary, and this step was taken by the Eleatics when they opposed their thought to the thought of others as being the way of truth in contrast to the way of opinion. Zeno, "the dialectical Eleatic" (c. 490-430 B.C.) has been regarded as the "discoverer" of dialectic, for he attempted to strengthen Eleatic doctrines involving the underlying unity of reality by showing that their difficulties for common sense are matched by difficulties equally great for those who believe in multiplicity and change. And he does this by the logical device of taking his opponents' position as a premise, and showing that this leads either to two opposite conclusions that contradict one another, or else to a <u>reductio ad absurdum</u>. One meaning of the term "dialectic" today is the showing of contradictions in experience.

The Sophists (450-400 B.C.) made a further contribution to the development of logic. The Sophistic age may be designated as the age of loose thought, and the contribution of the Sophists to logic lies in their development of the art of argumentative discussion. They were probably more interested in instructing than in demonstrating, so that they were content with persuasion rather than rational conviction.[2] They began with customary opinions accepted without criticism, and held without clearness. To this type of reasoning Aristotle gave the name "dialectic": reasoning "from opinions that are generally accepted".[3] These men were aware that, in a sense, anything could be debated; yet at the same time they were not aware of the fact that there are principles of the structure of thought which determine and limit the movement of thought itself. In this sense all things cannot be debated. The Sophists, however, furthered the transition from free thought to logic proper in two ways:

(1) They made logic possible. Their incessant questioning and hairsplitting led to distinctions of value. Their paradoxical insistence upon the accidents of speech-forms and thought-forms led inevitably in the end to a perception of the essentials of those forms.

(2) They made logic necessary. The spirit of debate run riot evoked a counter-spirit to order and control it. The result was a self-limiting dialectic, and this higher dialectic is a logic. The first of the philosophical Sophists, Gorgias (483-375 B.C.), raises issues which

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2. Stebbing, MIL, 477.
3. Aristotle, Topica, I, 100a, 25.

are as much logical and epistemological as they are ontological. The meaning of the copula and the relation of thoughts to objects of which they are thoughts are as much involved as the nature of being. The problems raised by the relativism of Protagoras (484-411 B.C.) are no less fundamentally problems of the nature of knowledge and of the structure of thought.

But it remained for Socrates (470-399 B.C.) to establish the real basis for logic as we know it today. Grote says of him:

> Sokrates was the first who broke ground for Logic - for testing the difference between good and bad ratiocination. He did this by enquiry as to the definition of general terms and by the dialectical exposure of the ignorance generally prevalent among those who familiarly used them.[4]

Socrates made a lasting contribution to the science of formal reasoning. His was the initial development of argument by the question and answer method (the famous "socratic method") and by his painful extraction of definitions from the muddled and contradictory nature of the common opinions of his contemporaries. By his constant endeavors to limit or define his concepts he at least fostered logic and prepared the way for its being set up as an independent philosophical concern. From his attempts at definition, Socrates went on to what is now called induction, which in his case was a form of questionnaire in which he made an effort to elicit a consensus of opinion from which a generalization might be drawn. Aristotle gives Socrates credit for the elaboration of

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4. Grote, ARI, 426.

the two logical functions of general definition and inductive method.[5] Socrates gives no theory of either, but uses them with a practical end in view without any attempt to systematize them into a logical instrument.[6]

A further development of logic in principle was made by Plato (427-347 B.C.), who utilized the methods of Socrates and also tackled many problems of method and attempted to discover proper heads of classification by which the complexity of facts might be made to yield to correct meanings and interpretations. Especially is this true in the so-called "Socratic" dialogues of Plato, such as Apology, Crito, Protagoras, Meno, Gorgias, etc., in which he follows the same negative procedure as Socrates, exposing many examples of undefined and equivocal phraseology. Plato's most remarkable contribution is without a doubt the principle that our success in reasoning depends upon the degree to which we are able to co-ordinate systematically all the relevant facts of our experience, within and without, into an ordered and harmonious system.[7]

An interesting study of Plato's logic, if it may be properly

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5. Aristotle, MET, xii, 4, 1078b. By "induction", Aristotle means deduction, for the method of Socrates was modeled on mathematical demonstration (see Plato's Meno, where a geometrical demonstration is stated to be knowledge). He persuaded his contemporaries to venture a definition, and then he criticized that definition. This method "is essentially deductive for it is by drawing or deducing the consequences of the definition that it is shown to be justified or the reverse"; Dubs, RI, 51.

6. It is interesting to note that in many of the Socratic dialogues of Plato, no final definition of the subject in question is ever arrived at.

7. Warbeke, SMG, 277.

termed logic, has been made by Lutoslawski, in his The Origin and Growth of Plato's Logic. This writer holds that Plato was the first man in the history of human thought who may be properly called a logician, although he qualifies his statement by saying "at least [he is the] first logician whose writings have reached us in a form as complete as they were known to his contemporaries".[8] He distinguishes between an earlier stage, which he designates as the "Socratic stage", and a later stage in the logic of Plato. The Socratic stage is held to be probable because we know from Aristotle's Metaphysics that Plato owed to Socrates the tendency to form exact definitions of ethical notions. This tendency to form exact definitions is especially noticeable in the shorter dialogues, and in the Protagoras, Meno, Euthydemus, and Gorgias, four works in which Socrates is represented as triumphant over the Sophists. All have in common a predominating ethical aim, and they deal with the definition of virtue and the various parts of virtue, as well as with the question as to whether or not virtue, like knowledge, can be taught. In all of them, however, logical questions, as such, are only lightly touched upon.[9]

In the Protagoras, in discussing knowledge and how to arrive at it, Plato states the principle that each notion has only one contradictory to itself, and he gives examples of this rule without, however, making any distinction between contradictory and contrary terms.[10] In the Meno,

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8. Lutoslawski, OGPL, 3.

9. Of the shorter dialogues, only five are important for an investigation of the development of Plato's logic, viz., Euthypro, Apology, Crito, Laches, and Charmides; Lutoslawski, OGPL, 196.

10. In the tenth book of the Republic, Plato formulates the law of contradiction as a law of thought.

Plato makes a careful distinction between particular and general affirmations. It is in this dialogue that Plato first lays down his rule of "dialectic"; a requirement that all who wish to discuss dialectically must base their reasoning upon recognized notions or premises. For both Socrates and Plato the great antithesis was between Dialectic and Rhetoric:

> ...interchange of short question and answer before a select audience as contrasted with long continuous speech addressed to a miscellaneous crowd with known established sentiments and opinions, in the view of persuading them on some given interesting point requiring decision.[11]

As a method of verifying doubtful propositions, Plato proposes to look for consequences from certain hypotheses set up prior to a discussion; a method which he describes as an "hypothetical argument".[12] But other than these few scattered instances, Plato makes no attempt to classify them as principles of reasoning.[13]

But the rules of dialectical discussion enabled Plato to attain a degree of certitude never before approached. Starting from recognized

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11. Grote, ARI, 263.
12. Plato, DP (Jowett), I, 262.
13. It is interesting to note Plato's conception of knowledge in the three dialogues Sophist, Politicus, and Philebus. In these dialogues Plato develops the classification of notions. Knowledge ceases to be pure intuition, and becomes the product of thought as a co-ordinating agency. This activity of thought has produced the existing order in the material universe, and our human thought is but a reproduction of the more perfect divine thought. Classification and co-ordination, analysis and synthesis, are the two powerful instruments of inquiry. Soul and movement are the ultimate explanation of everything that takes place. Here Plato anticipates Hegel, and Hegel borrows from him.

premises, dividing and distinguishing notions, following up the consequences of each hypothesis, and avoiding all unjustifiable generalizations, Plato set up

> ...an ideal of infallible knowledge, far above traditional opinions, and he distinguishes this scientific knowledge from common belief by his ability to show a reason for each assertion. The methodic connection of thought gave to his conclusions a permanence and consistency which unscientific opinion never reaches.[14]

This logical method was first applied to the questions unsuccessfully attacked in his earlier writings, and in the Gorgias Plato produced a consistent theory of virtue and of the aims of life.

But although Socrates to a lesser extent, and Plato to a greater extent dealt with the problem of the consistency of thought, it remained for Aristotle (384-322 B.C.) to be the first to work out, in any comprehensive way, the processes of thought in order to discover and systematize the specific conditions and laws of correct procedure which must be the minimum ground for valid reasoning. He for the first time specifically segregates the problem of reasonableness (cogency of thought as such) from the psychological descriptions of how the mind acts, as well as from the metaphysical problem of the ultimate nature of reason or the mind.

In this brief historical survey of the development of the science of logic, we will simply mention Aristotle as the founder of the systematic science, leaving an evaluation and criticism of his contribution to a following chapter.

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14. Lutoslawski, OGPL, 216-217.

Aristotle is the father of logic as a formal science, and he founded the science of logic when he realized the importance of the form of a proposition and was led thereby to the recognition that all deduction is formal. Since his day, "traditional" logic has been that which does not go beyond the logical doctrines of Aristotle but contents itself with an elaboration of its technical details. Common to all "traditional" logicians is the acceptance of the subject-predicate doctrine of the traditional Aristotelian schedule of propositions and the restriction of deduction to the syllogistic form. The logic as formulated by Aristotle about 330 B.C. persisted as the backbone of logical analysis up to the middle of the 19th century.

In the subsequent development of logic, in so far as the Aristotelian framework of the science was accepted, that development is limited to minor corrections and extensions of a formal kind. Aristotle laid down the structure that the rest of the history of logic carried out. Even the great philosopher Kant (1724-1804) treated technical logic in a wholly traditional manner, and his contribution to formal logic is, in itself, negligible. Kant's system has, however, an important relationship to Hegel's logic, and it will be dealt with in a following chapter.

The development of modern logic has taken, in general, two forms. The first of these is the development of a generalized, or pure, logic; a logic which is purely symbolic and mathematical. Traditionally, the syllogism has been treated as a form of argument; i.e., as an attempt to demonstrate that a certain proposition (the conclusion) is true because some other propositions (the premises) are true. As such,

the syllogism is not concerned with the truth, or falsity, of the conclusion, or of the premises, but only with the validity of the reasoning, which depends upon the form alone. In this sense, Aristotle's logic is a logic of form, and his theory of the syllogism is the earliest attempt to exhibit the purely formal principles of deduction. As a logical principle, it suffers from three main defects: (1) its restriction to a single mode of deduction, the syllogism; (2) its failure to symbolize the relations involved in the premises of the syllogism; and (3) its defective analysis of these relations. Since the logical analysis of the syllogism is purely formal, the form can just as well be expressed by substituting symbols for words. The usual example of a syllogism:

All men are mortal

Socrates is a man

Therefore Socrates is mortal

is not a logically simple form. The traditional syllogistic logic does not assert the conclusion, but only the fact that the premises jointly involve the conclusion as a necessary result. To be correct, then, the syllogism should be stated in the form: If all men are mortal, and Socrates is a man, then Socrates is mortal. It is obvious that the validity of the reasoning does not depend upon the fact that Socrates is mentioned. It would do just as well is we substituted Plato, Spinoza, Hitler, or any other individual, for Socrates. What we are asserting is a relation between "being a man" and "being mortal", and this can just as well be denoted by algebraic symbols as by words, for words themselves are only symbols. This purely formal character of syllogistic reasoning

has given rise to the modern school of symbolic or mathematical logic. Since the syllogism is completely formal, there is no necessary reference to any given reality; any terms may be exchanged for any others in a syllogism with no danger to the validity of its conclusions. The implication, therefore, can be asserted concerning anything that can be fitted into the form. "The ideal of the logician is complete generality; he attains this ideal by making his assertions completely formal".[15]

Leibniz (1646-1716) was the first to conceive, although he did not perfect, a wider logic in which, as ordinary language imitates on paper words representing objects, there would be a symbolic language every character of which would stand for a simple concept. These symbols would constitute an "alphabet of human thought" correspinding to all possible simple ideas, and these simple ideas would be primitive concepts out of which more complex concepts could be constructed by using the symbolic language as a calculus of reasoning, like an algebra. Leibniz failed to influence logic to any great extent because he never published his works on these subjects. The foundations of the science of symbolic logic were laid by George Boole (1815-1864), who conceived and developed a symbolic system whose significance is independent of its interpretation. That is, it is a logic which is not restricted to any definite series of forms, like the syllogism, but is applicable to all kinds of propositions or problems which can be conceived and stated. It is a logic in which idea-symbols are substituted for sound symbols, and thinking becomes a

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15. Stebbing, MIL, 165.

process of relating terms in equations, irrespective of the subject matter to which those terms may apply. Thus, it is adapted for use in modern physical science where the scientist is interested mainly in the abstract relations which obtain in the field of mathematics. Such logic is also used in realistic ontology, in which the ultimate world is a sphere of neutral entities or a world of mere is-ness; and the science which describes this world and its relations is the logic of abstract, mathematical symbolism. In this logic, therefore, the symbols express certain necessary logical relations which can be interpreted and applied to reality in any number of ways. This new logic has been further developed by the contemporary philosophers, Whitehead and Russell, who have shown that all of mathematics is equivalent to pure logic.[16]

The second form in which modern logic has developed is the science of inductive logic. The development of logic as purely symbolic ends in the conception of abstract deductive systems that must be interpreted if they are to be regarded as applying to the existent world. The sciences other than mathematics are concerned with the discovery of generalizations and with the establishment of comprehensive theories capable of verification in experience. The method whereby this is done is called "scientific method", and also "inductive logic".

It is to be noted that Aristotle not only discovered the form of deductive inference, but that he also saw the problem that it presented: the problem of the truth of ultimate premises. For Aristotle, scientific

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16. For a fuller treatment of symbolic logic, see Stebbing, MIL, 478-487. Stebbing's entire work is written from the standpoint of modern symbolic logic.

demonstration is absolute demonstration; and he recognized the fact that if his conclusions were to have the character of absolute demonstration, they must logically follow from absolute premises. Scientific knowledge, in a narrow sense, is, for Aristotle, the deduction of the particular from the general. The problem of every proof is the deduction of the conditioned from its grounds in which knowledge as such consists. The hypotheses of a proof must therefore consist of necessary propositions of general validity. A proof is only complete and absolute when what has to be proved has been deduced from its first hypothesis through all the intermediate stages. Such a deduction would not be possible if the hypotheses from which it is derived must be, in their turn, deduced from something further, and so on ad infinitum. In other words, absolute demonstration is impossible if an infinite number of stages lie between the hypotheses and what must be deduced from them; we become lost in the infinite regress. Deduction can only be accomplished when there is a finite number of prosyllogisms. All mediate knowledge, therefore, presupposes an immediate knowledge. There must be ultimate principles or premises which cannot be demonstrated simply because they are ultimate; principles beyond which it is entirely irrational to look. Just as the facts of experience are known to us directly, through perception, Aristotle recognizes in the reason of man a power of immediate, direct, and consequently error-free knowledge of the most general principles.[17]

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17. Aristotle did not consider the problem whether these principles are merely formal, or whether ideas of definite content, like the idea of God, can be known in this way. The principle of intuitive, immediate, knowledge opens up a whole area of epistemological investigation. The principle is attacked particularly by Hegel.

He therefore based his ultimate principles upon a special faculty, an intuitive power, nous, or reason, which he held provides the immediate major premises that are perceived in experience or by enumeration.[18]

Aristotle nowhere gives a list of ultimate principles but merely states the one principle he considers the most certain of all: the law of non-contradiction.[19] He deduces nothing from it, but does "show that the laws of non-contradiction and excluded middle are involved in the making of any significant assertion whatever".[20]

But it is one thing to hold to immediate intuition of ultimate principles, and quite another to validate the conviction. Having reached this point in his reasoning, Aristotle was still confronted by a further problem: If there are ultimate principles, or premises, wherein does their validity lie? The scientific basis for his immediate principles Aristotle finds in induction, which confirms a general statement by showing its actual validity in all the particular cases to which it refers. Since Aristotle is forced to admit that complete observation of every particular case is impossible, he therefore utilizes the procedure of Socrates. He takes as a basis of his induction those hypotheses which from the number or authority of their supporters would seem to have been derived from experience, and endeavors to reach correct determinations by a dialectical comparison and testing of these hypotheses.

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18. Cf. F.C.S. Schiller, FL, 235.
19. Aristotle, MET, IV, 1005b.
20. Dubs, RI, 59; Aristotle, MET, IV, ii.

Definition, therefore, in the Aristotelian system, rests partly on deductive proof and partly on immediate knowledge which receives confirmation by means of an inductive process. For validating ultimate premises, Aristotle invented what has since been called induction by complete enumeration, or perfect enumeration. A proposition is shown to hold of each member of a group, and hence of the group as a whole. But his treatment of induction was in the main cursory, and he aimed only at finding a secure basis for his deductive logic which he assumed was fundamental to all reasoning. He utilized induction, not to find truth, but to substantiate his pre-conceived method of reasoning. In some cases, principles are based upon only one instance from experience, and the logical system of Aristotle has been open to much criticism at this point. From Aristotle down through the Scholastics of the Middle Ages, deduction was the only method of determining truth.

The Renaissance in Europe saw the protests of Francis Bacon (1561-1626) in the interests of scientific experimentation, and of John Locke (1632-1704), who leveled against Aristotle the famous jibe, "God has not been so sparing to men to make them barely two-legged creatures, and left it to Aristotle to make them rational".[21] The development of modern thought was motivated by scientific aspirations which could no longer be satisfied with the verbal explanations of the scholastic logic. The trend was away from the barren manner of syllogizing to the concrete facts of experience. The question faced by science became: Can the

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21. Locke, Essay, IV, xvii, 4 (Fraser, II, 391).

ordinary facts of experience lead us to generalizations which can be considered true with respect to reality? Thus arose the tendency, which appears on the horizon with the advent of modern science, to proceed inductively from the particular to the general. Science, in the modern sense of the term, is based upon the inductive process of reasoning.[22] Bacon held that, in order to arrive at generally valid knowledge, we must compare particular observations or experiments and take into account not only similarities (as in the case of Aristotle's "simple enumeration"), but also negative instances. "This method, however, does not yet quite correspond to the experimental thinking employed in modern physics".[23] Bacon gives evidence of an insufficient insight into the value of quantitative determination, and he fails to grasp the full significance of the function of hypotheses and the importance which they assume through the use of mathematics. Having defined his famous "Idols" (fallacies of reasoning), he says, in Aphorism xxxvi: "One method of delivery remains to us, which is simply this: we must lead men to the particulars themselves, and their series and order; while men on their side must force themselves for a while to lay their notions by and begin to familiarize themselves with facts".[24] Bacon objected rightly to the over-emphasis of deduction as a method of attaining truth, but he did not foresee the extent to which knowledge could be increased by the use of reasonable

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22. It should be pointed out that deduction is a constituent part of the inductive process.
23. Enriques, HDL, 48.
24. Frost, MP, 183.

hypotheses. He remained behind the ideas which contemporary scientists, like Kepler (1571-1630) and Galileo (1564-1642), realized. Bacon's was a "pseudo-induction" according to Enriques, for Bacon himself made no observations or experiments to substantiate it, and he advocated the scholastic method of discovering the simple qualities of things, the things themselves then following from these properties by composition.[25] "Bacon was contented to develop a method of discovery, and leave to others its utilization".[26] For him the great instrument to understanding is the abandonment of random discovery for deliberate research.

John Locke (1632-1704), Thomas Hobbes (1588-1679), and David Hume (1711-1776), as leaders of the movement known as the "Enlightenment", contributed to the development of modern inductive logic by their emphasis upon what is known as "empiricism". By this term is meant the belief that "the original source of all our information about the outside world is sensation, although sense data can and should be analyzed, interpreted, and criticized by the reason".[27] The most important work, however, was done in the 19th century by John Stuart Mill (1806-1873), who sought to systematize inductive logic as Aristotle had systematized deductive logic. He began where Bacon had left off, and not only systematized methods of induction, but he included in his treatment the emphasis upon experimentation which Bacon had recommended but had not developed.

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25. Enriques, HDL, 49.
26. Fuller, HP, II, 50.
27. Wright, HMP, 140.

The result of Mill's work is the statement of certain "Methods" of inductive reasoning which are today basic to all scientific investigation. These methods he divided into four groups, each of which, as we shall see a little later, contributes some particular advantage to scientific investigation: (1) The Method of Agreement; (2) the Method of Difference; and the Indirect Method of Difference, or what he terms the "Joint Method of Agreement and Difference";[28] (3) the Method of Residues; and (4) the Method of Concomitant Variations. Mill speaks of these methods as follows:

> The four methods which it has now been attempted to describe, are the only possible modes of experimental inquiry - of direct induction a posteriori, as distinguished from deduction; ...these, then, with such assistance as can be obtained from deduction, compose the available resources of the human mind for ascertaining the laws of the succession of phenomena.[29]

In these methods, Mill stresses the importance of experimentation. He enlarges upon Bacon's rule of varying the circumstances: "This is, indeed, only the first rule of physical inquiry, and not, as some have thought, the sole rule; but it is the foundation of all the rest".[30] For the purpose of varying the circumstances, we have recourse either to observation of experiment - we may either find an instance in nature suited to our purposes, or, by an artificial arrangement of circumstances, make one. Mill draws no logical distinction between the two processes

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28. Mill, SOL, 278.
29. Ibid., 291. See his entire treatment of the methods, 278-291.
30. Ibid., 273 (italics mine).

of investigation, but he does point out that the latter, experimentation, is an immense extension of the former, from a practical point of view:

> It [experiment] not only enables us to produce a much greater number of variations in the circumstances than nature spontaneously offers, but also, in thousands of cases, to produce the precise sort of variation which we are in want of for discovering the law of the phenomenon.[31]

Burtt, in discussing Mill's methods, emphasizes the fact that none of these is a "method"; "their role is rather to direct one's choice of appropriate methods when investigating evidence for inductive conclusions".[32] He speaks of them as being "principles" that are fundamental in guiding the process of causal induction - "the process, that is, which issues if successful in the establishment of universal laws on the basis of a sample composed of selected instances of the conjunctions in question".[33]

The logical significance of these principles lies in their correction of the high percentage of inadequacy under the method of simple enumeration. The investigator who has recognized the part played in investigation by the influence of the factors of recency and vividness in generalization is on the way toward true scientific knowledge, but he may still fall prey to errors of popular generalization which factual science has in a large measure uncovered and rendered unnecessary.

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31. Mill, SOL, 274.
32. Burtt, RT, 318.
33. Ibid., 317.

The principles of agreement and difference take into account not only the observable instances from which a generalization may be drawn, but also the exceptions to those generalizations. Unless a generalization has been formed with a conscious recognition of these exceptions, no universal law can be set up, for the conjunction of the events that have been observed might have been the result of chance, or it might have taken place under certain specific conditions in which the law holds good. Thus, the principles guiding the verification of scientific hypotheses are aimed at determining the dependable causal conditions and contexts which operate in the conjunctions observed. Scientific investigation, therefore, aims specifically at attempting to puncture its own hypotheses! Only a hypothesis which has shown itself able to stand the test of systematic and unfriendly investigation can be safely affirmed as a verified scientific law. Anything less than such a procedure involves the danger of having an assumed universal law overthrown by more extensive observation of a given phenomenon.

To illustrate the immense significance of experiment in Mill's logic of induction we have need to note only the difference between the operation of his Method of Agreement and his Method of Difference. Burtt gives the Method of Agreement as follows:

> The conjunction of two phenomena may be affirmed as a causal law if every observed instance of one is followed or preceded in its proper context by an instance of the other, no exception having occurred in any of the varied circumstances under which it occurs in that context.[34]

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34. Burtt, RT, 323.

This method consists simply in the observation of certain events which result consistently whenever certain conditions are present. For example, one eats mushrooms and becomes violently ill. If it is noted that every time mushrooms are eaten, violent illness results, a conjunction between the eating of mushrooms and the resultant illness can be inferred. But the necessity to go beyond the simple method of agreement (which is only slightly better than mere enumeration) is seen in the fact that, in the example given above, it is quite possible that there is a <u>second</u> factor present in the context which we have not discovered and which is the real cause of the illness. In other words, what we need to do is to establish the fact that <u>only</u> the mushrooms are the cause of the illness, or, to express the idea differently, we need to replace the many-one relationship given by the method of agreement with the one-one relationship which is possible with the method of difference.

The Method of Difference is stated by Burtt as follows:

> The conjunction of two phenomena may be affirmed as a one-one causal law if the occurrence of one, in its proper context, is always followed or preceded by the appearance of the other, and its non-occurrence under circumstances otherwise similar to those in which it occurs, by the non-appearance of the other.[35]

With the principle of difference <u>experiment under controlled conditions</u> comes in. Experiment may, it is true, be used when one is being guided merely by the principle of agreement, but it is of distinctive value when the principle of difference is being used. To the

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35. Burtt, RT, 328.

question, What is the essence of scientific experimentation? Burtt answers:

> It consists in artificial manipulation of phenomena, so that they or the parts into which they can be analyzed may be added or removed one by one, enabling the experimenter to observe precisely what happens in the presence or absence of each, and with much less likelihood that unnoticed factors are betraying his calculations. With experiment, a thinker definitely passes from a mode of verification which does not involve more than systematic observation, with no special tools to aid him, of what is happening in the world apart from his interference, to modes which do depend upon his interference. And there is a significant difference between a situation in which one is simply watching carefully what Nature is doing already, and a situation in which he actively manipulates objects so as to force her to engage in performances which apart from such manipulation, would rarely occur, if ever, or to omit performances that would otherwise take place.[36]

As soon as scientific inquirers learned how to introduce active experimentation in a systematic way, every branch of knowledge increased by leaps and bounds to undreamed of achievement. In so far as experiment can be carried out systematically, it <u>compels</u> any exception to a hypothesized law to present itself if it exists. Experiment forces Nature to reveal her secrets without the scientist being forced to wait until she spontaneously produces the condition or the situation he desires to study, and such secrets can be examined sometimes at times and places that are convenient for us. Many conditions occur very rarely in Nature without our interference, and others, though they occur spontaneously,

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36. Burtt, RT, 329.

they do so in ways which do not permit detailed analysis and measurement.[37]

It should be noted that in modern science the concept of progress has taken the place of the ideal of a demonstrative science based upon immutable principles which thus make science itself immutable. The ideal of science today may be stated to be an hypothesis which brings together with the least amount of distortion and the most clarity the whole of human experience. It is not enough merely to describe events as they take place; what science is in need of is an explanation of how events take place with a view toward determining the extent to which they may be expected to take place in the future. Science consists in the systematic relating of events, spatio-temporally, to other events which are concomitant with them, whose occurrence would lead us to expect the former. Explanatory truth is not expected to be absolute; science is satisfied if a conjunction of events can be demonstrated. As Burtt says:

> Anything is explained when it is viewed as one member of a class of similar events, and when another class of events has been found to be regularly conjoined with it in this way.[38]

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37. See Burtt, 316-341, for an explanation of causal laws and the methods of modern scientific experimentation; see also, 511-540, where he discusses completely the application of inductive procedures particularly in the fields of psychology, sociology, and other social sciences, where accurate results are especially difficult to obtain.

38. Burtt, RT, 229.

A given event is considered to be adequately explained (at least for scientific purposes) if it can be dependably predicted with respect to its further occurrence. Such an explanation is based upon two postulates which are themselves not absolute principles but hypotheses which have been proved by long experience to be dependable:

(1) The postulate of predictive uniformity; which affirms that if B was followed by A in the past, the same conjunction will hold in the future. Or, stated negatively (which is just as important), an absence of uniformity in the past will hold for the future also.

(2) The postulate of causality; which carries the postulate of uniformity farther than the mere prediction of events in the future to the principle that every event in the world has specifiable causes.

On the basis of these two postulates, and by the use of the inductive methods of Mill, plus the methods of hypothesis and experimentation, science arrives at probable truth. Scientific constructions, therefore, are based not so much upon first principles which are immediately suggested by simple observations as upon principles which always follow as consequences from the preceding scientific development. "For what we deduce from provisionally accepted hypotheses leads through experimental verification to their criticism and renovation".[39]

Modern inductive logic, therefore, is limited in the sense that it is never capable of yielding general principles whose certainty is so established that they stand in no need of verification. In addition, it

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39. Enriques, HDL, 51.

is impossible to verify the consequences of an hypothesis or a principle independently of the acceptance of other hypotheses. Inductive logic, purely as such, has given way to a system of theories in which the construction, demonstration, and evolution of systems of concepts representing various orders of phenomena are dealt with. Scientific induction, or the scientific method of research, may be outlined somewhat as follows:

(1) Location and Definition of Problem
Observation
Notation
Co-ordination of related facts

(2) Formulation of an Explanatory Hypothesis or Mechanism
(Solution of Problem)
Deduction

(3) Testing or Verification of Hypothesis
Experimentation

(4) Growth (revision of old hypothesis or the substitution of a new one, in which latter case the whole method is repeated)

From this process, science arrives at a generalization and its aim is to extend this generalization to other areas of the phenomenal world. This it does by a uniting of deductive and inductive methods of logical inquiry. The conclusion of modern logic is that the proper procedure in scientific investigation is a combination of both the inductive (hypothetical) and deductive methods.[40] The relation of deduction to induction is a necessary one because our search for facts has often led into experimentation which a little insight into general principles would have shown to be futile. Aristotle's advice to make induction and

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40. See Mill, SOL, 156, where he notes the function of formal logic as auxiliary to the logic of truth (induction). The logic of consistency is recognized as a valuable and necessary part of the logic of truth because what is inconsistent with itself cannot be true.

deduction reciprocal, testing our conclusions by particular cases as well as by general principles is followed in scientific method today. The development of a theory into a more and more comprehensive system of knowledge is made possible "only by the union of exact mathematical deduction and accurate observation".[41] The union of deduction and induction is shown in Newton's correction of the Keplerian laws of planetary motion. Having deduced the calculation of central forces from the laws of Kepler, which were the result of long astronomical observations (induction), he generalized the hypothesis by assuming the universality of the attraction between material masses.

Thus the concept of knowledge from the point of view of modern inductive logic has changed from that of absolute demonstration to that of probability. Science gives no absolute certainty; all we can hope for is a high degree of probability. It is well to remember what Enriques so adequately says:

> Deduction brought to full light thus appears as a means for correcting hypothetical premises, that is, as a proper instrument of induction. The new conception of science as historical removes the stumbling-block of the ancients: the dilemma between the impossibility of demonstrative science and the necessity of indubitable principles. Science is regarded now as cumulative, as a progress of systems or deductive theories gradually coming nearer to reality, each growing out of the preceding and erecting its consequences into more and more general principles.[42]

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41. Stebbing, MIL, 492.
42. Enriques, HDL, 96.

The chief point of interest to us in this survey of the development of logic is the fact that, as far as syllogistic logic is concerned, it has remained essentially the same as it was when Aristotle had finished a systematization of its principles for the first time. That Aristotle's logic is today the basis of the common formal or syllogistic reasoning has been well expressed by Fuller, when he says:

> Aristotle...produced a Logic that not only is the first systematic work of its kind in European philosophy, but also, after some twenty-four hundred years, still ranks as an all-important contribution to the subject. Indeed, no work of his, unless perhaps it be his Ethics, has had so great and so permanent an influence upon later thought.[43]

In many of the histories of logic, Hegel's logic is not treated as a logic, but as a metaphysics, and therefore usually receives but a bare mention. Hegel held that logic has a double identity: it is explanatory of the forms of thought, and at the same time an exposition of the principles of being. Logic is, according to Hegel, the system of pure reason, or the Absolute Idea in the abstract element of its being. In his logic, he brings in the chief definitions of formal logic, but he submits them to a transformation according to the demands of his dialectical method, and at the same time giving them an objective significance. But his logic is a true logic for it purports to be an exposition of the movement of human or finite thought as well as of Absolute Reason, and the principles upon which it is based have a direct bearing

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43. Fuller, HGP, III, 162.

upon the logical processes of reasoning. Thus, Baillie and Wallace say of it:

> The logic of Hegel is the only rival to the logic of Aristotle. What Aristotle did for demonstrative reasoning, Hegel attempted to do for the whole of knowledge. His logic is an enumeration of the forms or categories by which our experience exists. ...The fact which ordinary thought ignores, and of which ordinary logic therefore provides no account, is the presence of gradation and continuity in the world. The general terms of language simplify the universe by reducing its variety of individuals to a few forms, none of which exists simply and perfectly. The method of the understanding is to divide and then give a separate reality to what is thus distinguished. It is part of Hegel's plan to remedy this one-sided character of thought, by laying bare the gradations of ideas. He lays special stress on the point that abstract ideas when held in their abstraction are almost interchangeable with their opposites - that extremes meet, and that in every true and concrete idea there is a coincidence of opposites.
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> ...The merit of Hegel is to have indicated and to a large extent displayed, the filiation and mutual limitation of our forms of thought; to have arranged them in the order of their comparative capacity to give a satisfactory expression to truth in the totality of its relations.[44]

The logic, therefore, over against which Hegel placed his own new conception of logic is the pure logic of consistency of Aristotle. The following chapter will be concerned with an evaluation and criticism of Aristotle's contribution to the science of formal logic.

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44. Enc. Brit., XI, 382-383.

CHAPTER TWO

THE PROBLEM AND LIMITATIONS OF SYLLOGISTIC LOGIC

Aristotle's logical treatises fall into three main divisions:[1] (1) The Analytica Priora, in which Aristotle deals with what he regards as common to all reasoning, the syllogism, and which aims at an exhibition of its formal varieties irrespective of the nature of the subject matter dealt with. This portion of his logic comprises his formal logic, or the logic of consistency. (2) The Analytica Posteriora, in which Aristotle discusses the further characteristics which reasoning must have if it is to be not only self-consistent, but in the full sense scientific as well. This portion of his logic deals, not with mere consistency, but with truth as such. (3) The Topica and De Sophisticis Elenchis,[2] in which Aristotle considers those modes of reasoning which are syllogistically correct, but which fail to satisfy one or more of the laws of scientific thought. The Categoriae and the De Interpretatione, which deal, roughly speaking, with the term and the proposition respectively, may be considered as preliminary. What is to be noted here is the fact that Aristotle composed these various works separately, without indicating that they belonged together as an aggregate, and without grouping them in a single department under a single name.[3]

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1. Ross, ARI, 20-21.
2. This short treatise belongs to the Topica as its concluding book, although generally known as an individual treatise with a separate title.
3. Hamilton, LML, II, 19; Grote, ARI, 56.

Aristotle divides the sciences into three distinct groups or classifications: the theoretical, the practical, and the productive.[4] The general aim of each division is knowledge, but each division is specifically aimed at, respectively, knowledge, conduct, and the making of useful or beautiful objects. The theoretical division, which aims at knowledge as such, deals with intelligence alone in so far as intelligence has to do with the apprehension of principles, causes, and constituent elements. But the point to be noted here is that logic, as a science, remains outside of this classification, for, according to Aristotle, logic is not a substantive science, but a part of the general culture which everyone should absorb before he undertakes to study any science; that which alone will enable him to know which of his propositions demand proof, and what kind of proof is demanded in any given instance.[5]

Having produced his logical works as separate treatises, it was left for Aristotle's followers to group these treatises under the title of Organon (the Instrument, that is, of knowledge)[6] and from it there gradually emerged a system of logic. The production of Aristotle's log-

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4. Ross, ARI, 20; Aristotle, MET, V.

5. That Aristotle makes this statement in so many words is not certain. This statement represents what his method of dealing with the subject implies as to his estimation of it.

6. Andronicus, the earliest known editor of Aristotle's works, "considered these treatises, taken collectively, to be not so much a part of philosophy as an Organon or instrument, the use of which must be acquired by the reader before he became competent to grasp or comprehend philosophy"; Grote, ARI, 55. Andronicus Rhodius (of Rhodes) was a Peripatetic philosopher who collected, revised, and arranged the works of Aristotle about 80 B.C. He is said to have invented the term "metaphysics". None of his works are extant.

ical treatises as relatively self-contained treatises accounts for the absence of a precise definition of their field of inquiry. Wolf and Blunt say of Aristotle's logic:

> Aristotle gave no clear intimation of the place this field of inquiry was to hold in relation to the other disciplines. In his definite classification of the sciences it hs no place. The logical inquiry seems to be conceived as dealing with the thought of which the objects are objects. It is to be regarded as a propaedeutic which is not concerned directly with object-reality, but with the determination for the thinking subject of what constitutes the knowledge correlative to being.[7]

The term "logic" as it is applied to the science today was unknown to Aristotle. Alexander of Aphrodisias, the oldest commentator on the works of Aristotle known to us, was the first writer to use in the sense in which it is used today.[8] Aristotle's name for the science was "Analytics", by which he referred "primarily to the analysis of reasoning into the figures of the syllogism, or perhaps even to the analysis of the syllogism into propositions, and of propositions into terms".[9] In other words, Aristotle's logic is essentially analytic; it is a logic of classes.

The word λογική is derived from the word λόγος , which had a twofold meaning in the Greek. It denoted both thought, and its expression in language. Aristotle, in order to contradistinguish λόγος , mean-

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7. Enc. Brit., XIV, 318.
8. Hamilton, LML, II, 4. Alexander of Aphrodisias, surnamed Exegetes (the "Expounder") was a celebrated philosopher and commentator on Aristotle who flourished in the early part of the 3rd century A.D.
9. Ross, ARI, 22.

ing thought, from λόγος , meaning speech, calls the former τὸν ἔσω or τὸν ἐν τῇ ψυχῇ : that within, that in the mind; while he calls the latter τὸν ἔξω : that without. This ambiguity of the word passed into its derivative λογική , and this ambiguity has exerted an influence on the views held in regard to the ultimate purpose or object of the science down through the history of philosophy.[10]

The most ancient name for what is now called logic is dialectic. This word, διαλεκτική , is derived from the Greek verb διαλέγεσθαι , meaning to hold conversation or discourse together; and the word dialectic therefore signifies, literally, conversation, controversy, or dispute. Plato applied the term not merely to the process of logical inference, but also to metaphysical speculation.[11] The opinion is generally held that Aristotle restricts the meaning of the word dialectic to a particular and applied part of logic, not to the science as a whole. He applies it purely to the logic of probability, and it is thus equivalent in meaning to what he designates as Topica.[12]

The greater number of Aristotle's logical writings have perished, and those we have in our possession exhibit to us only his view of the science considered in its parts, or in certain of its special relations. None of the treatises now included in the Organon considers the science from a central point of view. There is some ground for believing that in

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10. Hamilton, LML, II, 5.
11. Hegel has applied the same term to metaphysical speculation alone.
12. Hamilton, LML, II, 6.

those writings of Aristotle now lost, the sphere of logic was developed much more comprehensively than the comparatively few treatises which we possess would seem to indicate. The result has been that logicians have allowed Aristotle's view of the partial relations of logic to influence their conception of the science as a whole. Logic, on the basis of the few logical writings of Aristotle that have come down to us, has been considered to be a science of the form and not the matter of thought; in other words, it has been held that the object of logic is the formal laws of thought in the sense that it is interested mainly in conceptions, judgments, and reasonings, not as they are in themselves, but only as they are as regulators of thought. The same view can be traced down through the Kantian view of logic, and becomes one of the criticisms which Hegel leveled against it.

The sum of the whole matter is this: Aristotle himself did not define the sphere of logic. On the basis of those writings of his which we possess, it may be said that logic is the science of the pure form of reasoning.

We have seen how the processes of reasoning were recognized by Socrates and Plato to have some sort of laws according to which they operate, but these men gave expression to some of these principles without in any way attempting any logical analysis of them. They did make some contribution in the matter of definition and classification, but nothing in the way of a systematic formulation of laws was made by them. Having associated with Plato, and being the possessor of the rich heritage handed down from Socrates and a keen, analytical mind, it is small

wonder that Aristotle should feel led to reflect upon the character and principles of the mental processes by means of which he arrived at his conclusions in other fields of knowledge. With him, the way in which truth could be obtained was fully as much of a problem as the questions arising in any of the sciences. Thought, merely as thought, constituted a problem for Aristotle.

Now the only way thoughts could be expressed was in language. Thoughts were crystallized in language which had a grammar and could be expressed in nouns, verbs, adverbs, adjectives, and other parts of speech. What would be more natural than to look for the existence of the laws of thought as somehow related to language? Thus Fuller expresses this same idea, when he says:

> His arguments, both with himself and others, had to be carried on along hard and fast lines from which there could be no deviation if his conclusions were to carry weight. Behind these grammatical and forensic necessities there must be an inflexible structure of some sort which thinking was obliged to embody if it was to make sense and to present the truth.[13]

Since this was true, what would be more logical to suppose than that there is a "grammar" governing correct thinking which the grammar of language follows and expresses? Thus arose the problem of the laws by which truth could be obtained. That problem, viewed in the light of the systematic body of his results, may be expressed thus: What are the unchangeable principles governing all reasoning, and how can they be sys-

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13. Fuller, HGP, 162-163.

tematized into a compact body of knowledge capable of guiding us in determining the truth or falsity of our judgments? This is the problem faced in Aristotle's logic, and the logic itself gives us the answer to this problem, and nothing more. All we have in syllogistic logic is the science of the form of valid reasoning; syllogistic logic is analytical, formal, and abstract.[14]

Thus, a modern definition of syllogistic logic emphasizes the purely formal aspect of the science; for example, the definition provided by Eaton in his General Logic:

> Logic is the science that exhibits all the relationships permitting valid inferences that hold between various kinds of propositions considered merely in respect to their form.[15]

It is from Aristotle's restriction of himself to this problem that certain limitations of his logic emerge, and in taking up these limitations, it will be seen that they are involved with certain presuppositions which underlie his treatment of the subject.

To begin with, Aristotle's work in logic was an entirely new thing; he had nothing upon which to base his logical system except the results of his own genius. When he was writing in the field of rhetoric, all he had to do was to enlarge upon pre-existing suggestions, for there were not only masters who taught the subject but also writers who theorized about it. When it came to logic, however, nothing whatever had

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14. Cf. Chapter V, where it is demonstrated that this terminology is not to be taken absolutely.
15. Eaton, GL, 8.

been done in a systematic way. The teachers and theorizers of the rhetorical dialogue of the day had nothing of particular merit to offer, and what they did have was unsystematic and sometimes downright misleading. And so Aristotle could claim originality in dealing with the subject.[16] What he produced was the result of his own labors according to his own method. Thus, Aristotle himself says,

> In regard to the process of syllogizing, I found positively nothing said before me; I had to work it out for myself by long and laborious research.[17]

Aristotle began this laborious research by tackling simple, uncombined terms, and as a result of his analysis he performed a profound service to philosophy by making the first distinction between univocal and equivocal terms to which were assigned definite, technical names.[18] From simple, uncombined terms he moved on to propositions in which these terms were combined, and applied his method of analysis to them. It is in connection with his analysis of propositions that he made his first great contribution to the science of logic. In treating the categories of thought and distinguishing between predicates which can be predicated of a subject and those which can be predicated in a subject, Aristotle

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16. Note the closing chapter of the Sophisticis Elenchis in which Aristotle expressly and emphatically asserts his claim to originality as a theorist on logic, and declares himself to have worked out even the first beginnings of such theory by laborious application of the method of analysis. See the interesting discussion of this matter in Grote, ARI, 418-421.

17. The translation is that of Grote, ARI, 263.

18. Aristotle's names are synonymous and homonymous, respectively.

made one very important observation respecting those predicates which he describes as being affirmed or denied of a suvject: "When you predicate this thing or that of another thing as of a subject, the predicates then of the predicate will also hold good of the subject".[19] This statement deserves notice, says Grote, "because it is in fact a brief but distinct announcement of his theory of the syllogism",[20] which he afterward elaborates and expands in the Analytica Priora, where he discusses it in all its varieties.[21]

Having analyzed propositions separately, dividing them into separate classes according to their constituent elements, Aristotle then considers propositions in combination. As a result of this analysis, he reaches the conclusion that the syllogism is fundamental to all reasoning; and he defines the syllogism as follows:

> A syllogism is a form of words in which when certain assumptions are made, something other than what has been assumed necessarily follows from the fact that the assumptions are such.[22]

Now Aristotle's assumption that the syllogism is the fundamental form of reasoning is no arbitrary assumption, but depends to a great extent upon the results of his analysis of the function of language. His syllogism is based upon an immediate intuition of ultimate premises,[23]

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19. Grote translates this: "Whatever predicate can be truly affirmed or denied of the predicate, the same can be truly affirmed or denied of the subject"; ARI, 65.

20. Grote, ARI, 65.

21. Aristotle discusses the syllogism in three figures only. The introduction of the fourth figure is attributed to Galen (2nd century A.D.) by Averroes (12th century A.D.), and is frequently referred to as the "Galenian Figure"; Frye & Levi, RB, 277.

22. Aristotle, Analytica Priora, I, b 19-21.

23. Cf. Chapter I, 14.

and upon certain laws of thought which he considers to be the presuppositions upon which all reasoning is based.

It should be noted here that syllogistic logic deals with the results of thinking rather than with the nature of the thought process. "Its object is less to give an account of the way in which thinking goes on, than to show how the ideas and thoughts we already possess may be combined so as to lead to conclusions that are certain, and that will compel assent".[24] It is largely with words, as the expression of thought, that syllogistic logic deals. Yet it is important to remember that the rules formulated in syllogistic logic are not arbitrary and external, but find their justification in the nature of thought itself. In order to understand syllogistic logic correctly, therefore, it is necessary to look beyond the words and propositions dealt with to the thought whose nature they express.

Fundamental to the principle of the syllogism is the principle traditionally called the dictum de omni et nullo,[25] which means that whatever is predicated, either affirmatively or negatively, of a term distributed may be predicated in like manner of everything contained under it. This means simply that what may be affirmed of all things in a given class may be affirmed also of any one or any part of those things included in the class, and what may be denied of all things in a class may be denied of any one or any part of them. This is the principle of class

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24. Creighton, IL, 45.
25. The Latin phrase means, "Statement concerning all and none".

inclusion or exclusion. This dictum is the foundation of syllogistic deduction. In addition, the valid operation of the syllogism requires as presuppositions certain fundamental principles traditionally referred to as the "laws of thought". These laws of thought are usually regarded as axioms, or propositions which require no independent proof because they are in themselves self-evident. These principles are three in number:

(1) The Law of Identity. Whatever is, is; A is A.

(2) The Law of Contradiction. Nothing can both be and not be; A is not non-A.

(3) The Law of Excluded Middle. There is no middle ground between contradictories; any term, A, is either B or non-B.

The statement of these principles appears in the highest degree foolish, for their meaning seems obvious to anyone who stops to think about them. Yet their position as basic to valid syllogizing is important, and often reasoning is invalid because the principles underlying it are so obvious as to have been overlooked. The important thing about these laws is that they are fundamental to consistency, and their self-evident character lies in the fact that they cannot be denied without at the same time asserting them. As soon as you try to get along without them, you assert them.

The basic law of thought might be said to be either the Law of Identity or the Law of Contradiction, depending upon whether the principle is stated affirmatively or negatively. Both of these laws are actually the same, the only difference being a positive or a negative expression. Their priority one over the other is immaterial, for whichever one is

taken to be prior, the other is necessarily presupposed by it. Both of these laws are simply the expression, in either affirmative or negative form, respectively, of the principle of consistency; the fundamental postulate of all thought that it must, as the minimum requirement of truth, at least be consistent with itself. All that the Law of Identity means is the fact that, if there is to be any knowledge, the character of notions or concepts must remain fixed. This does not mean that objects cannot change or cease to exist or that what is true at this moment must be true forever; it means only that we can consider an object of thought in as many aspects as we please and still recognize that we are concerned with the same identical object of thought.

The Law of Contradiction means simply that we cannot both affirm and deny the same thing at the same time; nothing can have at the same time and at the same place contradictory and inconsistent qualities. It really involves the distinction between "is" and "is not". In other words, we contradict ourselves if we say that an object is both black and white in the same respect at the same time.[26]

The Law of Excluded Middle results partly from the statement of the previous two laws, and partly from Aristotle's differentiation between contraries and contradictories. The law is really the complement of the Law of Contradiction and means simply that every statement must be either true or false; it cannot be both at the same time.

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26. See Hamilton, LML, II, 58-59, where he holds that the Law of Contradiction ought more properly to be called the "Law of Non-Contradiction", as it enjoins the absence of contradiction as the indispensable condition of thought.

These laws, then, are universally and necessarily true, and when applied in reasoning about objects, become the foundation of reasoning. Hamilton has aptly called them "the conditions of the thinkable".[27] All acts of reasoning proceed from certain judgments, and the act of judging consists in comparing two ideas to see whether they agree or differ. The laws of thought inform us as to the nature of this identity or difference with which all thought is concerned. The use of these fundamental principles, coupled with the dictum de omni et nullo, makes the reasoning contained in the syllogism valid.

The Greek word συλλογισμός occurs in Plato, but not in the sense given to it by Aristotle, and, as we have seen, no one at an earlier date had made any attempt to give a systematic account of the process of inference. The nearest appraoch, probably, was Plato's formulation of the process of logical division, which Aristotle refers to as a "weak syllogism".[28] Aristotle's primary interest in developing the syllogism was in laying down the conditions of scientific knowledge - this he states to be his purpose in the beginning of the Analytica Priora, and towards this the formal study of the syllogism was the first step.

Aristotle's logic, although resulting in a purely formal discipline, had its basis in epistemology, or in Aristotle's conception of

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27. Hamilton, LML, II, 57.
28. Aristotle, Analytica Priora, 46a, 33. Aristotle is thinking of Plato's establishment of definition by means of the division by dichotomy.

the task of thought; this task of thought could only be understood by a definition of the relation of knowledge to its object. As such, logic has its roots in the Socratic-Platonic doctrine of ideas.[29] That which truly is, is the general or universal, and knowledge of this is the conception. Aristotle opposes the arbitrary separation of the general from the particular,[30] and conceives the real task of logic to be that of recognizing the true relation between the general and the particular, and therefore the fundamental form of abstract or conceptual thought stands in the center of his logic. If the question is asked, How can one prove anything scientifically? Aristotle would answer that scientific proof consists only in the deduction of the particular from the general. "To prove scientifically means to state the grounds for the validity of what is asserted, and these are to be found only in the more general under which the particular is subsumed".[31]

Since proof consists in deduction, it is the task of logic to determine exactly what this deduction is, or, in other words, to set forth those forms in which thought perceives the dependence of the particular upon the general. It is as a result of the analysis of those activities of thought in which all deduction consists that Aristotle arrives at the syllogism as the fundamental form of all reasoning. Thus

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29. Windelband, HP, 133.
30. What Aristotle attacks in Plato's theory of ideas was only the Eleatic assumption of absence of relation between the general and particular, between Ideas and phenomena; Cf. Aristotle, MET, I, 9; XIII, 4.
31. Windelband, HP, 134.

all reasoning for Aristotle consists in the deduction of one judgment from two other judgments.

It is to be noted that the conclusion of any syllogism is a statement of the relations between the middle term and two other concepts, and that this relation is always of one kind only: a relation of the subordination of the particular under the general. The only question ever considered in syllogistic logic is whether one concept (the subject) is to be considered as subordinate to another (the predicate) or not. And thus Aristotle's treatment of the judgment concerns itself with the only two elements which essentially affect this relation of subordination: Quantity, which denotes a kind of subordination, whether that kind is distinguished as universal, particular, or singular; and Quality, which denotes that the relation is either affirmed or denied, or, that a relationship of inclusion or exclusion is asserted as existing between the two concepts.

As a result of the analytic method which Aristotle used in his formulation of syllogistic logic, certain limitations of syllogistic logic emerge.

In the first place, syllogistic logic is of an abstract or formal character. Aristotle's immediate aim was methodological, and the methodological character of his logic is responsible for the fact that it is abstract and formal.[32] That syllogistic possesses this characteristic is demonstrated by the fact that the truth of a given proposition

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32. Windelband, HP, 133.

remains unaffected by the substitution of symbols for terms.[33] The material with which syllogistic logic deals is supplied in the form of concepts and judgments. The problem of syllogistic logic is to show what combinations of concepts or judgments can be employed as premises which lead to valid conclusions in the syllogism. Aristotle was dealing with validating forms of inference, and he shows these forms in abstraction from the particular subject matter to which they apply.

As we have seen, the operation of drawing a conclusion from two premises in the syllogism is based upon the principle of consistency or non-contradiction, and the limitation of this vehicle of reasoning is noted in the fact that, in so far as the doctrine of the syllogism is concerned, anything is true which is not self-contradictory. Aristotle's logic is a logic of consistency, or classes within classes; it does not take into consideration classifications which depend upon actual truth or falsity. All it deals with is the possibility that given propositions <u>might</u> be true, or they <u>might</u> be false. Syllogistic logic shows only how certain conclusions follow <u>consistently</u> from certain premises, and for this purpose all considerations of truth or falsity are irrelevant. Logic thus abstracts the form from the matter, leaving aside the actual truth or falsehood and confining itself to formal validity.

At this point the difference between validity and truth should be made clear. Burtt defines a true proposition as one that agrees with the relevant facts.[34] <u>Truth</u>, therefore, has to do with the agreement of

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33. Cf. Chapter I, 16-18.
34. Burtt, RT, 113.

a proposition with reality. Validity, on the other hand, refers to an implication which obtains between propositions. "An implication obtains between two propositions, and therefore the inference of one from the other is valid, when and only when the truth of the second is warranted by the truth of the first".[35] Thus, a given conclusion may be said to be true or false and valid or invalid. When a proposition is said to be true or false, what is meant is that it is either correct or incorrect, respectively, as a description of the facts which it purports to describe. When a proposition is said to be valid or invalid, what is meant is that it is or is not implied by the premises from which it is drawn. Thus, the validity of propositions may be said to incorporate formal truth; for the truth in this case depends on the formal relations between propositions. Formal truths are guaranteed by the nature of formal reason itself. Material truth, however, can be tested only by an appeal to matters-of-fact - to experience. In the case of formal logic, all that is taken into account is formal truth; material truth may be involved in it, or it may not. "What is important in actual reasoning is that the two kinds of truth, formal truth and material truth, be merged; for the principles governing the formal relations do guarantee the truth of conclusions derived from true premises".[36]

Deductive logic, therefore, comes to its end in the statement of

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35. Burtt, RT., 113.
36. Frye & Levi, RB, 259.

the principles of valid reasoning. Although Aristotle did relate his formal science to reality[37] and would never hold that it did not apply to real things, his results are in a distinct sense formal, not material, and it is in this fact that Aristotle's logic is sharply defined from that of Hegel.

Syllogistic logic frequently results in an artificial separation between the truth of consistency and material truth. It is possible, as Aristotle himself recognized, to be logically consistent and yet to arrive at a conclusion which is materially false. Aristotle's logic is therefore distinctly and specifically a limited instrument, for it does not produce new truth; it brings to light only what is specifically implied in truths which are already known. This fact constiutes the second limitation of syllogistic logic: its failure as an adequate instrument for the discovery of new truth. It is limited to those premises already available to us. Aristotle recognized the necessity of basing his syllogistic reasoning upon ultimate principles whose truth is a certainty. Only thus might his conclusions be certain. But the method he adopted for the obtaining of such ultimate principles (recourse to immediate intuition) gives us absolutely no way in which to acquire new truth. Aristotle did lay emphasis upon induction and examples, even when

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37. Cf. F.C.S. Schiller, FL, 8. See Grote, ARI, 61-64, where he discusses, under the Categories, Aristotle's distinction between matters predicated of a subject and matters predicated in a subject. Aristotle, in the first treatise of the Organon, appears to blend logic and ontology into one.

limited in number, and he regarded induction as clearer to us, more persuasive, and more intelligible in terms of sense than deduction.

In the Analytica Priora he attempted to bring induction under syllogistic testing, but the attempt was not very successful. "He seems here to have supposed that Induction required to be perfect, i.e., to embrace all possible specimen or cases in order to be fully cogent. Yet elsewhere he also recognized an Induction which falls short of such completeness".[38] It is unfortunate that Aristotle did not devote more attention to hypothesis and experiment. There is no doubt but that Aristotelian logic has a real value of its own, and that its value has been recognized by and has greatly influenced western civilization. But we are no longer content merely to exhibit the supposed certainty of what knowledge we already possess - we feel that to gain new knowledge is more important than establishing the certainty of what we already have. Since Aristotle derived his patterns from mathematics and language, his logic stressed certainty rather than the adventure upon which so much of modern scientific discovery has depended.

Dubs points out that there has been a misunderstanding on the part of many modern philosophers as to the proper function of formal logic and the syllogism, so that many of them, beginning with Descartes and Bacon, have criticized the Aristotelian logic. In connection with this fact, Dubs remarks:

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38. Warbeke, SMG, 285-286. Cf. Aristotle, Analytica Posteriora, 100b, 31; Analytica Priora, 68b, 24-37; Topica, 105a, 13-16.

> They supposed that the function of logic is to discover new knowledge, that logic is the science and art of reasoning, that it should give truth; while they found that logic, especially the syllogism, cannot discover anything new, but can only set out those truths already given. They also found that the procedure of the syllogism is a petitio principii; that the natural procedure in argument is not syllogistic; and that syllogism cannot convince absolutely or give truth, because it can never prove its major premises. They therefore concluded that syllogistic logic is useless. These objections, which constitute the staple of the traditional attacks upon deductive logic and the Aristotelian syllogism, are due to a misunderstanding of the nature of logic; philosophers have expected logic to do that for which it is unfitted, and then have become disappointed in logic! The better procedure would have been first to have discovered the proper function of logic before criticizing her.[39]

Warbeke, also,[40] tells us that to expect formal logic to lead to the discovery of new truth is foolish. The fundamental nature of logic is basic to all science, philosophy, and religion, but it is not to be supposed that logic will give us knowledge in these fields; it is important, not as a method of discovery, but as a means of testing the correctness of the instruments of reason. Two extremes ought to be avoided: the position that logic is unnecessary, and the position that it is a means to knowledge.

We ought, then, to guard against expecting from logic more than it can furnish us. Logic tests conclusions - it does not of itself produce them. Thus, Dubs reminds us:

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39. Dubs, RI, 196.
40. Warbeke, SMG, 276.

> Purely deductive reasoning is...powerless to draw a single conclusion with certainty [of its material truth]. The syllogism...is not an instrument of discovery but merely an instrument of criticism. ...The function of a syllogism is merely to test an inference that is already drawn, to determine its validity, or to indicate what propositions are needed to establish a conclusion whose ground is already partially given.[41]

The limitation of syllogistic logic here is a real one, and the objection is valid if the limitation and scope of syllogistic logic is kept before the mind. Nothing can be established by deduction alone, and unless certainty can be had by some non-deductive means, no certainty can be obtained by deductive means.

Another limitation of syllogistic logic arises from its basic principle that every proposition consists of a subject qualified by a predicate; that is, syllogistic logic is limited by its conception of classes, and by its principle of class inclusion and class exclusion. Knowledge for Aristotle consisted exclusively of definition and classification. A thing was defined when the mind had grasped the essence which makes things to be what they truly are. Classification concerned the ontological exclusions and inclusions of objects in real natural kinds or species. In Aristotle's classification, he believed the number of species and genera to be limited and explorable, and their properties to be the same forever. Consequently, everything that is can be classified according to a specific genus.

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41. Dubs, RI, 186, 188. See his analysis here.

On this basis, Aristotle analyzes propositions into subject and predicate, each of which constitutes a class, and the principle of the syllogism serves to either include in or exclude from a given class. His logic, therefore, deals only with that which is common to large classes of propositions, and he analyzes propositions solely into one subject and one predicate, with either inclusion in a class, or exclusion from a class, as the quality of the proposition.

In such a treatment of propositions, syllogistic logic is necessarily limited, for no inference can ever be drawn about the relations of two objects to each other unless the object with which each of them is compared is is both cases the same. In other words, syllogistic deduction is possible only when a relation of identity can be established between two like things and a conclusion which is identical to them (or at least may be treated so). Relationships between propositions are therefore ultimately reducible to relationships between their terms. The logic does not conceive the idea of any proposition as standing, by itself as a whole, in logical relationship to any other proposition as a whole; the treatment of propositions as single, unanalyzed entities has no place in it.

Aristotle assumed with insufficient proof that a conclusion can be obtained only when a subject-predicate relationship between two terms is inferred from subject-predicate relations between them and a third term.[42] If Aristotle had studied mathematics closely enough he would

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42. Ross, ARI, 32.

have recognized the existence of non-syllogistic relations, such as quality, to the right of, etc., which are just as cogent as the syllogistic relation.

Stebbing refers to the failure of Aristotelian logic to recognize different propositional forms as a "radical defect".[43] Modern logic (symbolic or mathematical) recognizes this limitation and carries logic beyond Aristotle, forming generalizations about <u>any</u> proposition, whether that proposition can be analyzed into subject or predicate or not.

To sum up, then, syllogistic logic is primarily a method for criticizing thought; it is an instrument for determining the consistency of our ideas, and as such constitutes the <u>minimum</u> ground for truth. Ideas which are inconsistent cannot be true. But only thus far does syllogistic logic go. As a method, it can never lead to the discovery of new truth; it is a specifically limited instrument designed solely to demonstrate or exhibit the certainty of our formulation of what knowledge we already possess, and even then it does not include in its scope all of the relations of that truth. It treats knowledge from an atomistic, analytic point of view. It treats knowledge from the point of view of its parts without taking into consideration wholes which have properties which their parts do not possess. It is restricted solely to the deducing of implications concerning objects or ideas which they may possess by virtue of their belonging to a given class. It deals solely with the formal operation of thought processes without relating these

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43. Stebbing, MIL, 139.

processes to material truth. Syllogistic logic, therefore, is an extremely limited instrument. In the words of Gomperz, "rigour and consistency of thought - these are in truth the highest aims of the Aristotelian logic, at once its strength and its limitation.[44]

When we turn to a study of Hegel's logic we shall see that Hegel did not, as is often maintained, utterly discard syllogistic logic; on the contrary, he included it as a part of his logical system. Hegel's logic will be seen to regard the limitations and deficiencies of syllogistic logic as soluble in a larger whole of which it is a legitimate part. Consequently, Hegel goes far beyond it in comprehensiveness of treatment and comprehensiveness of result.

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44. Gomperz, GT, IV, 49.

CHAPTER THREE

THE ORIGIN AND NATURE OF HEGEL'S LOGIC

The historians of philosophy are unanimous in their declarations that of all the philosophical systems that have ever been set up, that of Hegel is by far the most comprehensive and inclusive. His philosophical system is prodigious in its complexity and scope, and the contributions of all the great minds of the past are in it absorbed and preserved and given new life and continuity with the whole of human knowledge and experience. All great thinkers had a part in influencing Hegel's thought, but two influences in particular are greater than any of the others: the idealism of the Greeks, and the critical philosophy of Immanuel Kant.

The significance of Hegel in the history of philosophy may be said to be the fact that he unites in one system the Aristotelian and Kantian movements in thought.[1] The fundamental principles of Hegel are the fundamental principles of the Greeks and of Kant. Wallace mentions this continuity between the thought of Plato and Aristotle and that of Hegel in his introduction to Hegel's Philosophy of Mind:

> What Hegel proposes to give is no novel or special doctrine, but the universal philosophy which has passed on from age to age, here narrowed and there widened, but still essentially the same. It is conscious of its continuity and proud of its identity with the teachings of Plato and Aristotle.[2]

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1. Harris, HL, 25.
2. Hegel, POM (Wallace), 9.

It is interesting to note that Wallace refers to the philosophy of Hegel as containing essentially the "universal philosophy". The same terminology is used by Stace, who holds that Hegel's system is the synthesis of that which is characteristic of the universal, underlying truth in all the history of thought.

The fact that Hegel unites in one system the thought of the Greeks and the thought of Kant may be expressed in other words by saying that the ontological, objective movement in Greek philosophy, and the psychological, subjective movement of modern philosophy as represented by the supreme achievement of Kant, both come to the same conclusion; i.e., <u>both arrive at personal consciousness as the highest principle of life</u>. Or, to express the same fundamental idea in characteristically Hegelian terms, the objective philosophy of the Greeks may be termed the <u>thesis</u>, the subjective philosophy of Kant the <u>antithesis</u>, and the philosophy of Hegel the <u>synthesis</u>, which absorbs both, and rises beyond them to form a new whole having entirely new properties. Diagrammed, this important fact appears somewhat as follows:

$$\left.\begin{array}{l}\text{Aristotelian (objective)} \longrightarrow \text{personal reason} \\ \text{Kantian (subjective)} \longrightarrow \text{personal reason}\end{array}\right\} \text{Hegelian}$$

It will be advantageous to sketch briefly how this conclusion is arrived at.[3]

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3. The general outline followed here is that of Harris, HL, 22-34. Windelband gives a good treatment of Plato and Aristotle from the point of view of the problems involved, HP, 99-154.

The outstanding characteristic of early Greek philosophy is the objective nature of its investigations. On the whole, Greek philosophy investigated the objective coefficient of knowledge; what necessarily is rather than how we know it.[4] The Milesian philosophers, for example, were interested in the nature of reality. Beginning with Thales (624-546 B.C.), who first gave expression to the principle that beneath the various forms of the appearance of matter there is an underlying, unifying structure, the Milesians were the first to face this basic philosophical problem squarely and attempt to answer it without recourse to supernatural explanation. They all adopted the notion of a single, cosmic substance, or "stuff" of the universe, as the basic principle of reality. They assumed reality to be composed of such common physical and material substances as air and water. Although the incessant change exhibited by nature was accepted as self-evident and in no need of further analysis and explanation, they did give voice to a belief in the homogeneity and unity of the world, even though that unity was to be found in a material substance of some sort.

For our purpose we need only mention the work of Heraclitus in seeking to find the ultimate reality in change; the work of the Eleatics in their denial of change and their seeking to find the ultimate reality in a pure Being which nullified any change or variety; and the work of the Atomists in seeking, in the face of the undeniable experience of

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4. It is true that the Greek thinkers did deal with problems of psychology, ethics, and the problem of how knowledge is possible, but the metaphysical character of their investigations is prominent enough to warrant the above assertion.

change and the demand of thought for some kind of permanence, to harmonize the positions of the Eleatics and of Heraclitus and to discover the ultimate reality that would incorporate within it both permanence and change. In connection with these early thinkers, it is interesting to note that Hegel looks upon them in the light of the dialectical movement of thought of which we shall see more later. He considers that the Eleatics with their pure being constituted a thesis, in which the dialectic was a subjective one, resting in the contemplation of the subject (Zeno), and the Absolute was therefore an abstract identity.[5] The next step in the dialectic is that it must become objective, and this was brought about by Heraclitus, who, Hegel says, understands the Absolute as the process of the dialectic whereby the Absolute becomes manifested as change in things. Of course, a third step is necessary to produce the synthesis, which is the unity of the thesis (Eleatics) and antithesis (Heraclitus). Thus, Hegel says of Heraclitus:

> The advance requisite and made by Heraclitus is the progression from Being as the first immediate thought, to the category of Becoming as the second. This is the first concrete, the Absolute, as in it the unity of opposites. Thus with Heraclitus the philosophic idea is to be met with in its speculative form; the reasoning of Parmenides and Zeno is abstract understanding. ...Here we see land; there is no proposition of Heraclitus which I have not adopted in my Logic.[6]

The consummation of Greek metaphysics is to be found in the work of Plato and Aristotle, the great system-builders of Greek philosophy.

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5. Cf. Hegel, HP, I, 239-240.
6. Ibid., I, 278-279.

Plato may be looked upon as the first philosopher to advance the idea that reality is fundamentally immaterial. His philosophy may be said to be characterized by two convictions:[7] first, he was convinced that whatever the real may be, it must be that which is eternal, everlasting, unchanging, and perfect. This conviction, be it noted, was fundamentally Eleatic. Second, he was convinced that the sort of reality he believed genuine could not be found anywhere in the physical world. These two convictions "possessed Plato from the early years of his intellectual development. They became fundamental principles governing his thought and served to delineate the broad boundaries of his metaphysics and epistemology".[8]

As a result of these considerations, Plato was led to postulate a realm of Ideas, of objective universals which have an existence independent of the human mind and of nature. These Ideas constitute the ultimate reality. Whatever is real is the realm of phenomena is real only because of the participation of the universal Idea in it.[9] It should be noted here that these "Ideas" are not corporeal entities in the

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7. Burgess, IHP, 93.
8. Ibid., 93.
9. Plato was never too clear about the relation between these two realms, Ideas and Phenomena. In the Phaedrus, he emphasizes the independence of the Ideas, and the relation of phenomena to them is one of imitation or resemblance rather than participation. In the Parmenides, Plato criticizes the theory of Ideas, recognizing the problem as to how the universal Ideas can be known at all if they are absolutely independent of us. It is to be noted that in his later dialogues, Sophist, Politicus, Timaeus, Philebus, and Laws, Plato variously modifies his theory.
For a clear account of Plato's theory of Ideas, see Burgess, IHP, 93-100.

physical world, nor are they mental entities like the ideas present in the human mind. The Platonic Ideas are not in the mind either of man or of God. They are a special kind of entity which philosophy has traditionally spoken of as "substance"; that kind of entity which is self-dependent, self-existent, timeless, spaceless, and changeless, and which is itself the cause or essential nature of all things.

There are, then, two distinct realms of being for Plato; the realm of phenomena, of time and space relationships, and the realm of the eternal, universal Ideas. It is the realm of Ideas that explains the realm of phenomena, not the reverse. The phenomenal world Plato looks upon as being "unreal"; the world of sense takes on a measure of reality only in proportion to the degree to which objects in it correspond to, or partake of, the universal Ideas. Plato's result is a dualism between the phenomenal world known by sense-perception, and the eternal, transcendental world of Ideas, which is reality, and known only by reason. True knowledge consists in a comprehension of the universal Ideas through reason as over against the uncertain understanding obtained by mistaking the phenomenal world for the real, through sense perception. Because of the nature of the phenomenal world, the source of knowledge cannot be sensation, but reason, for sensation can never give us concepts of the eternal Ideas.

Plato thus drew a distinction between sense and reason, and between appearance and reality. From these considerations, two important points emerge:

(1) The real is the universal.[10] Reality is that which has a wholly dependent being; appearance is that which has only dependent being. The real is now the universal and does not exist.[11] Only particulars exist, and the theory of Ideas leads to the conclusion that the particulars which are perceived by sense-perception can be said to be real only to the degree to which they participate in, or partake of, the reality of the universal Idea. Thus, if appearance is dependent upon reality, reality must somehow produce the appearance.[12] This leads to the second important proposition of the universal philosophy:

(2) The universal is that absolute and ultimate being which is the foundation of all things, and which produces the world out of itself.[13]

Plato's outstanding contribution may be said to lie in the fact that he emphasized the nature of reality as fundamentally immaterial, and this conception of reality was developed further by Plato's great pupil, Aristotle. Plato's theory of Ideas immediately gave rise to the great problem of later Greek thought, and, indeed, one which troubled the minds of many thinkers through the Middle Ages and was partly responsible for the controversy between nominalism and realism. The essential problem,

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10. Stace, POH, 11. This statement is held by Stace to be the essential determination of what he calls the "universal philosophy", and the central element of idealism, whether of Plato, of Aristotle, or of Hegel.

11. The term "existence" is used with reference to that which is in the time and space order of the world.

12. The statement that the world is an "appearance" means only that its existence is dependent upon an ultimate being. It does not mean that the world is an illusion in any sense.

13. Stace, POH, 14.

simply stated, is this: How unite universal and particular?

Plato recognized the problem raised by his theory of Ideas, and he had attempted to answer it is his dialogue Timaeus by the conception of God as an Artificer, not as a Creator; an Artificer who, with the Ideas as models, occupies the position of a Laborer[14] who molds the chaotic material of the form-less Receptacle into an ordered cosmos. This is Plato's answer to the problem of how the universal and the particular are united. That it really fails to solve the problem is apparent; for matter being formed after a pattern furnished by the Ideas, and matter being united with the Ideas, are two entirely different things. The idea that particulars "partake of" or "participate in" the universal Ideas, that they are "imitations", or "copies", of the Ideas, is open to question at the point of its intelligibility.[15] But it should be remembered that Plato talks here in the language of probability, not certainty; it is the best account he was able to give.

Aristotle, too, recognized the difficulty inherent in Plato's doctrine, and he objected to the theory of Ideas on the ground that it set up an arbitrary and unreasonable separation of experience.[16] Aristotle, therefore, takes Plato's conception of reality as essentially immaterial and from it discovers the principle of absolute truth, which he applies to both nature and man.

Aristotle's view may be summed up as follows:[17]

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14. "Demi-urge" in the Greek is the regular word for artisan.
15. Burgess, IHP, 114.
16. Cf. Harris, HL, 31; Windelband, HP, 133; Aristotle, MET, I, 9.
17. It is impossible to do more here than give a cursory view of Aristotle's metaphysics. For a good, brief treatment, see Burgess, IHP, 118-124. Cf. Harris' treatment with reference to Hegel, HL, 22-34.

The uniting of universal and particular is accomplished by holding as an intuitive principle that the real is composed of substances exhibited in particular things and that these substances are many. In other words, the primal existence is substance, which is self-dependent, and upon which all else depends. Substance is not a transcendental Idea, but is constituted by the concrete, individual thing which is a complex of Form and Matter. The unity of universal and particular is to be found in the principle of causality, which Aristotle posits in four aspects, all of which together constitute active reason:[18]

(1) Formal Cause - the agent by which a thing is produced; it is really the definition of a thing.

(2) Material Cause - the "stuff" out of which things are made. It is not necessarily material or physical, but there must be something the formal cause can deal with.

(3) Final Cause - the purpose or end in view.

(4) Efficient Cause - the power that makes the formal cause apply to the material cause to achieve the final cause.

In terms of an illustration, the formal cause might be said to be the blueprint of a house that is to be built; the material cause would be the material out of which the house is made; the final cause would be the purpose or end in view (to live in); and the efficient cause would be the carpenter who furnishes the energy by which the actual operation is performed.

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18. Aristotle, MET, IV.

When these four causes are applied to nature, there is a subordination of the efficient and final causes to the formal, leaving only two causes to account for all things in nature: the formal cause (Form) and the material cause (Matter). Both of these causes are to be thought of as real and simultaneous in occurrence.

Matter and Form correspond, in Aristotle, to Potentiality and Actuality, respectively. Matter, be it noted, is not a material substance, but a metaphysical concept which refers to "raw-material"; to the formless from the viewpoint of specific form. Form refers to the structural organization or order of matter. Matter nowhere occurs as "pure"; pure matter without form is a conceptual abstraction. The individual is the matter as structure. On the other hand, there is no matter-less form, except in the one case of Pure Form, or God.[19] The individual is the form as organization and development.

From the relation and function of form and matter, Aristotle's system of development emerges. Any single object must be regarded as both form and matter. Burgess suggests that if we think of nature as an hierarchy, at one extreme of which is matter with very little form, at the other extreme of which is Pure Form without matter, the idea will be more easily grasped.[20] Between these extremes lie all the particular things containing various degrees of form and matter. Individual things

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19. Aristotle posits God as "actus purus", Pure Form, to escape being caught in the infinite regress.
20. Burgess, IHP, 121.

are so related in the hierarchy that any particular object will be the form of the one below it, and the matter of the one above it. Each particular in nature is potentially a higher form; the material for higher development. The change or activity that goes on in nature is the process of form realizing itself in matter. All things develop according to the inner principles of the forms inherent in them. This inner compelling force Aristotle calls "entelechy" (having purpose within), and the whole realm of nature is conceived as one vast process of the movement or realization of potentiality toward Pure Form, or God. God is the Prime Mover, who, while exerting no activity upon the world, draws the world to himself by his intrinsic perfection.[21] He it is who supplies the attractive force that makes possible the unfolding of the immanent potentialities of each form through the medium of matter.

Note here that God is not an impersonal Being; God is a conscious,[22] thinking Being who contemplates his own thought and Being. He is self-knowing, personal Reason. He is a perfect, living Being whose form of cognition is knowing by wholes or totalities, which Aristotle terms "speculative knowing". This is the highest activity of mind: the knowing of all the relations of a given thing in its cause.

The point to be stressed as a result of all of this is that the Aristotelian metaphysics, which is the consummation of the objective investigation of reality by the Greeks, is throughout purposive and teleological. The ultimate reality for Aristotle is God as active Reason,

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21. Aristotle, MET, VIII.
22. Aristotle's term is νόησις νοήσεως : "thinking of thinking". There was no Greek word for consciousness at the time he wrote.

and all occurrences in nature follow from an inner necessity produced by active Reason immanent in nature.

The end of objective philosophy, then, is the arrival at a conception of reality as mind or reason immanent in the world of nature. We shall see that the end of subjective will be the same conception.

Ancient scepticism had doubted the existence of objects in the physical world, and in this scepticism is to be found the root of modern subjective scepticism. The development toward a subjective philosophy moved through the controversy over universals; the controversy between nominalism and realism. "There is a perpetual recurrence of the antithesis between subjective and objective methods".[23] Nominalism held that universals are not real, but are all only subjective syntheses of thought; mere classifications. Reality consists of isolated individuals, each independent of the other. This is an atomistic view of reality, and its result is that nothing can be explained except on the postulation of an external intelligence who arranges and combines the independent atoms to produce the phenomena which we perceive in the world. All relations between the atoms must be transferred to the ordering intelligence, so that atomism collapses, for the atoms have become a useless scaffolding; the "ordering intellect" has become all in all. The only positive aspect of nominalism is that it attributes universality to the mind; for by making universality a product of the mind, it unconsciously attributes all substantial being to mind. Thus, Harris says, nominalism is the

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23. Harris, HL, 37.

"triumph of shallow thought over deeper and truer thought",[24] and it is forever dead because of the rise of the doctrine of the correlation of forces and the persistence of force in modern science, for modern science is realistic and holds to energy or activity rather than things as the true reality.

The controversy, however, continued up to David Hume and his complete scepticism. There is no metaphysical causality in the world as far as we can know, according to Hume. There is only the sequence of events in time. The basic reason for this is that every possible object of knowledge is reducible either to an impression or an idea. In spite of all the analysis we wish to make, the only relations between objects that we perceive are "those of continguity and succession".[25] The only reason we have for believing in cause is that we have found a continguous relationship to exist between what we call the effect and what we call the cause; two events related only by the fact that we have perceived them to succeed one another in time. The outcome of such a sceptical attitude is to arrive at the conclusion that a metaphysical cause has no reality; it is only a product of the mind.

From this point Immanuel Kant went on to develop an explanation of the world of man and the world of nature in time and space in terms of our subjective nature.

Kant's object was to determine the precise relation between thought and the object of knowledge. Two sources of knowledge were open

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24. Harris, HL, 35.
25. Burtt, EPBM, 629, 635.

to him: the perceptions given through experience, and the conceptions derived from a priori principles supposed by rationalism to be innate. Hume had demonstrated that the constitutive forms of the conceptual knowledge of reality are not given in perception, but are merely the products of association which have no demonstrable relation to the real. On the other hand, reflection indicated that reality could not be known by "given" conceptions. In other words, neither empiricism nor rationalism could explain the relation between knowledge and its object.[26] Kant's answer to the problem is found in his Critique of Pure Reason.[27]

For Kant, everything known or thought or expressed in language is known or thought or expressed by means of notions, ideas, or concepts, and explained by words which symbolize these general predicates or categories. Some of these are generalized from experience; others are furnished by the mind itself as a priori conditions necessary to all experience. The latter Kant calls "thought-forms", and shows that they are not derived from experience inasmuch as they are necessary for the very beginnings of such notions. These are called "pure thought" because they are free from all elements derived from contingent experience.[28]

The important thing about Kant's results is that he holds that to investigate the pure thought-notions is to investigate the laws of existence as it is known or knowable in experience. In other words, we cannot conceive existence as possible in any modes other than those of

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26. Cf. Windelband, HP, 537-538.
27. See Norman Kemp Smith's Commentary on Kant's "Critique of Pure Reason"; also, Watson, PKE, 27, 31-46.
28. Cf. Smith, CKCPR, 53-56; also xxxiii.

the a priori notions of the mind. These forms are, however, not "subjective", as Kant held; we cannot deny their validity as laws of all being without contradicting ourselves by setting up at the same time other notions or thoughts which transcend these "categories". Such a notion is Kant's notion of the "ding-an-sich". The "thing-in-itself" cannot exist without coming under some of the subjective categories of the mind. As Harris remarks,

> As for the objective, then, which is opposed to our subjectivity and unknowable by us, it cannot be extant in the world of nature or in the world of man. It is a pure figment of the imagination, and cannot exist in any possible world without becoming "subjective" at once.[29]

The point of significance here is that both the objective method of Greek philosophy and the subjective method of modern critical philosophy lead ultimately to the interpretation of reality in terms of mind. Hegel's system is the synthesis of the results of these two methods of investigation.

> His philosophy, in fact, may be regarded as simply the systematic attempt to reconcile the essential tendencies and ideals of Greek and modern thought, to harmonize the monistic universalism of the one with the monadistic individualism of the other.[30]

Thus Stace, in speaking of Hegel's philosophical system, is led to remark:

> The philosophy of Hegel...is not something simply invented out of nothing by himself and

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29. Harris, HL, 43.
30. Baillie, OSHL, 18. Cf. Windelband, HP, 612.

> flung at random into an astonished world. It is no crazy fancy of an individual's brain, no gimcrack novelty. It is not the pet theory of some erratic genius, nor is it merely one theory among many rivals. The true author of it is, not so much Hegel, as the toiling and thinking human spirit; the universal spirit of humanity getting itself uttered through this individual. It is the work of the ages. It has its roots deep in the past. It is the accumulated wisdom of the years, the last phase of the one "universal philosophy". For the truth is, to use a phrase of Hegel's, neither new or old, but permanent.[31]

The system of Hegel, then, has its origin in the comprehensive thought of the universal philosophy. It is the synthesis in which all that is true in previous thought has been included and given new significance in a whole that purports to explain adequately the whole of reality.

Hegel's results arose out of the immediate work of Fichte and Schelling. Both these thinkers recognized the fact that Kant's results led to the obvious identity of subjectivity and objectivity.[32] The whole trend of German idealism is toward the resolution of the contradictions raised by Kant's treatment of the "thing-in-itself": the assertion that things-in-themselves can be thought but not known.[33] Fichte, Schelling, and Hegel all took the lead in attempting to understand the world as a system of Reason, for there was a growing conviction that "if the thing-in-itself is to be concluded in philosophy at all it must be made to function in such fashion that it will make for a clearer, more

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31. Stace, POH, 31.
32. Cf. Baillie, OSHL, 43-48.
33. Windelband, HP, 546-547, 569.

definite understanding of the universe".[34] Fichte attempted to solve the problem of the relationship of the "thing-in-itself" to the rest of reality, and he found that there are only two possible solutions to the problem; namely, that experience, being an activity of consciousness, can be derived only from things, or from consciousness. He was led to despair of including both as the ground of consciousness, and consequently concluded that the unconscious "thing-in-itself" must be dispensed with, for consciousness can only be understood as a product of something which is itself of the nature of consciousness. But he saw in the world of nature more than merely the consciousness of one's private mental states. He conceived that the objective world must be considered to be, not the product of the individual reason, but the product of universal Reason, which becomes known to the particular mind as the phenomenal world. For Fichte, the world is fundamentally active and growing, a product of a basic spiritual activity unfolding itself in the phenomenal. But Fichte was not able to satisfactorily relate the ego with the non-ego,[35] and this led to Schelling's attempt to show how both were products of a still more ultimate reality. The "thing-in-itself" thus becomes Schelling's Absolute. But it remained as much in the background as it did in Kant, never getting into concrete experience, and therefore it never explained anything. It was essentially undetermined in its content, for with Schelling "the highest principle can be determined neither as real or ideal".[36]

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34. Burgess, IHP, 437.
35. Cf. Hegel's criticism of Fichte's system in his Encyclopädie, 119, 120. In essence, Fichte's "non-ego" is Kant's "thing-in-itself".
36. Windelband, HP, 608.

Schelling's conception of nature as fundamentally a unity with all parts of the universe being understood adequately only in relation to their proper place within the unity of the Absolute Reason, and Fichte's conception that the universe is Reason in the process of becoming objectified, both appear as important points of emphasis in Hegel.

Hegel's reaction to the work of his predecessors was to reject completely the concept of the "thing-in-itself"; the concept of an Absolute or totality of things which remains hidden forever. "The Thing-in-itself", he says, "expresses the object when we leave out of sight all that consciousness makes of it, all its emotional aspects, and all specific thoughts of it. It is easy to see what is left - utter abstraction, total emptiness, only described still as an 'other-world'".[37] Hegel's starting-point, therefore, is the belief that the dilemma facing him could be resolved by assuming that the conditions of knowing are identical with those of reality itself. In other words, the forms of cognition are the principles of being. What being is may be understood by an investigation of the forms of thought. In this, Hegel's method is just the reverse of that of Aristotle. Aristotle would hold that things come first, and thought follows things rather than things following thought.

For Hegel, then, reason and nature are not to be distinguished from each other; nature, as the manifestation of reason, cannot be distinguished from it. Hegel, therefore, looks upon a study of the uni-

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37. Hegel, Encyclopädie (Wallace), 91-92.

verse as it is as the only way of discovering the truth of reality. There is no need of the useless concept that there is something besides the universe.

As a result of this, Hegel objects to the common conception of logic, both syllogistic and transcendental, for he conceives that logic should be identified with metaphysics. Thus, he says, in the introduction to his Science of Logic:

> Kant considers that logic...is fortunate in that it has fallen to its lot to attain so early to completion, before the other sciences; for Logic has not taken any step backward since Aristotle, - but also it has taken no step forwards - the latter to all appearance because it was already finished and complete. If Logic has undergone no change since Aristotle...what is to be inferred from this is, that Logic is all the more in need of a thorough overhaul; for when Spirit has worked on for two thousand years, it must have reached a better reflective consciousness of its own thought and its own unadulterated essence. ...As a matter of fact...it may be said that, both in Form and in Content, as exhibited in textbooks, Logic has become contemptible.[38]

Hegel therefore speaks of Logic in terms of "the inadequate lifeless content"[39] of it, and gives as the reasons why it is so empty and lifeless:

> Its determinations are assumed to stand immovably rigid and are brought into a merely external relation with one another. Because in the operations of judgment and syllogism it is chiefly their quantitative element that

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38. Hegel, SOL, 62.
39. Ibid., 63.

> is referred to and built upon, everything rests on an external difference, on mere comparison, and becomes a wholly analytic procedure, a matter of merely mechanical calculation. The deduction of the so-called rules and laws (especially of Syllogism) is not much better than a manipulation of rods of unequal length in order to sort and arrange them according to size - like the child's game of trying to fit into their right places the various pieces of a picture puzzle.[40]

The way in which logic may be made to live is to give it content by recognizing it, not merely as the science of the subjective form of thought, but also as expressing the true nature of being. In other words, logic ceases to be merely subjective, but becomes objective as well. Thought and being are identified.

> Thoughts may be termed objective thoughts, - among which are also to be included the forms which are more especially discussed in the common logic where they are usually treated as forms of conscious thought only. Logic therefore coincides with Metaphysics, the science of things set and held in thoughts, - thoughts accredited able to express the essential reality of things.[41]

The chief distinction, then, between the logic of Hegel and syllogistic logic is the fact that, since Hegel's logic holds the central place of unfolding the method and principles of all thought, it is much more comprehensive than formal, syllogistic logic. It is synthetic as over against the purely analytic character of syllogistic logic. While syllogistic logic attempts to show only the formal laws of judgment and the syllogism, as principles by which all knowledge can be expressed,

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40. Hegel, SOL, 63.
41. Hegel, Encyclopädie, 45.

> Hegelian logic undertakes to show the genesis and indeed the complete biography of every ultimate "notion" - concept or idea - which is used or can be used in judgments or syllogisms to collect or analyze or explain the contents of experience. It has therefore to discuss the forms in which existence is possible, actual, or necessary, and is ontology or metaphysic as well as logic.[42]

The logic of Hegel is no mere appendage of his system, but an integral part of it. In a certain sense, it depends upon the results of his Phenomenology of Mind.[43] The Phenomenology is a survey of human experience as a whole, beginning with the first gleam of consciousness, working up through consciousness to the Absolute Spirit, and showing the dynamic relationship that exists between the Absolute Spirit and its manifestations in human self-consciousness and its institutions (Art, Religion, the State, etc.). To those who object to Hegel as being too rationalistic, it should be pointed out that he rests his whole system upon an empirical basis: a study of the development of human consciousness. This study was undertaken, not as a mere by-product of his system, external to it and independent of it. The Phenomenology should not be looked upon as a work from which the presuppositions of the Logic are derived, but, rather, as a work which "justifies" by an examination and description of experience certain presuppositions which are at the basis of the Logic, and which were in the mind of Hegel before he began to evolve his system on the basis of them. This fact Baillie brings out when he says:

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42. Harris, HL, 20.
43. This fact is stated by Hegel himself in his Encyclopädie, 58, and in POM, Introduction, passim.

> [The Phenomenology] is, therefore, the presupposition of the Logic in the sense that it establishes as a truth what Logic assumes at the start and throughout the system; it proves and justifies the presuppositions of speculative Logic.[44]

The relationship between the Logic and the Phenomenology is a reciprocal relationship: the Phenomenology, by a consideration of all the forms of truth found in experience, shows the truth contained in the Logic to be the ultimate truth of experience; on the other hand, the Logic is the abstract and systematic exposition of the final truth which is discovered as a result of the examination of experience in the Phenomenology. The fact should be noted that whether the Logic precedes the Phenomenology, or vice versa, is entirely irrelevant; both include the whole of Hegel's system, although from different aspects. The Phenomenology includes the whole of Hegel's system from the point of view of the concrete forms of actual experience; the Logic includes the whole from the point of view of its ultimate form.[45] But the Phenomenology remains as the empirical justification of the abstract content of the Logic. The content of the Phenomenology is essentially the content of the Logic, and the process of experience is, at its foundation, a logical process.[46]

The point to be noted here is that, while the Phenomenology may

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44. Baillie, OSHL, 211. Baillie speaks of the Phenomenology as a "critique of experience", but it is more accurate to view it as a "description of experience"; for Hegel does not attempt to clear away all preceding views and build up a system of his own, but, on the contrary, he asserts that every thinker has made some contribution to thought. Cf. Baillie, OSHL, 212.

45. Cf. Baillie's treatment of the relationship between the Logic and the Phenomenology in OSHL, 208-215.

46. Hegel, POM, 44-45.

be regarded as a vital part of Hegel's system, it has as its aim the demonstration of certain fundamental principles which Hegel conceived should be maintained in any true philosophy. As a result of the study, Hegel finds that experience will corroborate his assumptions, and therefore he is justified in the more abstract and systematic exposition of these assumptions, together with the essential method of all thinking, in his Logic.

A study of the introduction to the Phenomenology will disclose Hegel's fundamental presuppositions.

The most fundamental assumption of Hegel is that the ultimate reality, the Absolute, that upon which all else depends, is Mind, or Spirit (Geist).[47] In the introduction to the Phenomenology, Hegel says:

> In my view - a view which the developed exposition of the system alone can justify - everything depends on grasping and expressing the ultimate not as Substance /alone/ but as Subject as well.[48]

The Absolute of Hegel is not conceived of as an impersonal, objective being like the Absolute of Schelling, nor is it an infinite Substance like that of Spinoza. For Hegel, the Absolute is personal Spirit; a living, self-conscious personality which he constantly denotes as "Subject". It is the same as the "self-active Reason" of Aristotle. It is not to be supposed that Hegel means by Absolute Reason merely the subjective reason, for he identifies the Absolute with God.[49] Human reason is but the highest manifestation of the Absolute Reason. For Hegel, the only explanation for consciousness is active

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47. Baillie, OSHL, 137.
48. Hegel, POM, I, 15.
49. Hegel, Encyclopädie, 156.

consciousness or reason, and his Absolute, therefore, is essentially an ultimate Mind which is conscious of itself as Mind.

In Hegel's view, the two ideas of the Absolute as Mind, and of the universe as a system, appear united in his philosophy. What he has in mind is an exposition of absolute truth in such a way that the entire universe will be seen to have its ground in the unfolding development of the Absolute Reason.

> The systematic development of truth in scientific form can alone be the true shape in which truth exists. To help bring philosophy nearer to the form of science - that goal where it can lay aside the name of love of knowledge and be actual knowledge - that is what I have set before me.[50]

The following passage quoted from the Phenomenology contains within it not only Hegel's conception of the Absolute, but also contains the concomitants of that conception. Hegel writes:

> The living substance...is that being which is truly subject, or what is the same thing, is truly realized and actual solely in the process of positing itself, or in mediating with its own self its transitions from one state or position to the opposite. As subject it is pure and simple negativity, and just on that account a process of splitting up what is simple and undifferentiated, a process of duplicating and setting factors in opposition, which in turn is the negation of this indifferent diversity and the opposition of factors it entails. True reality is merely this process of re-instating self-identity, or reflecting into its own self in and from its other, and is not an original and primal unity as such, not an immediate unity

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50. Hegel, POM, 5.

> as such. It is the process of its own becoming, the circle which presupposes its own end or its purpose, and has its end for its beginning; it becomes concrete and actual only by being carried out, and by the end it involves.
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> ...Per se, the divine life is no doubt undisturbed identity and oneness with itself. ... But this "per se" is an abstract generality, where we abstract from its real nature which consists in its being objective to itself, conscious of itself on its own account; and where consequently we neglect altogether the self-movement which is the formal character of its activity. If the form is declared to correspond to the essence, it is just for that reason a misunderstanding to suppose that knowledge can be content with the "per se", the essence, but can do without the form. ...Precisely because the form is as necessary to the essence as the essence to it, absolute reality must not be conceived of and expressed as essence alone, i.e. as immediate substance, or as pure self-intuition of the Divine, but as form also, and with the entire wealth of the developed form. Only then is it grasped and expressed as really actual. The truth is the whole. The whole, however, is merely the essential nature reaching its completeness through the process of its own development.[51]

A careful study of the above passage will reveal the basic presuppositions of the Hegelian logic, and therefore of Hegel's system as a whole. They may be summarized briefly as follows:

(1) Reality is Absolute Mind, or Reason. By this is meant that the Absolute is not only of the nature of mind, but is personal, self-conscious mind as well.

(2) The true is the whole. By this Hegel means that no statement about an object can be called true until the statement is as ade-

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51. Hegel, POM, 16-17.

quate and as coherent as possible. Truth, for Hegel, means adequacy,[52] and his primary objection to syllogistic logic, and to the transcendental logic of Kant is that they are inadequate to the task of revealing truth.[53] In his discussion of Aristotelian logic in his History of Philosophy, Hegel says:

> But here we come across the drawback pertaining to the whole Aristotelian manner, as also to all succeeding logic - and that indeed in the highest degree - that in thought and the movement of thought as such, the individual moments fall asunder; there are a number of kinds of judgment and conclusion, each of which is held to be independent, and to have absolute truth as such. ...In this isolation they have, however, no truth; for their totality alone is the truth of thought. ...Aristotle is thus the originator of the logic of the understanding; its forms concern only the relationship of finite to finite and in them the truth cannot be grasped. ...His logic really requires recasting, so that all his determinations should be brought into a necessary systematic whole - ...one living organic whole, in which each part is held to be a part, and the whole alone as such is true.[54]

(3) The true is concrete, not abstract. Hegel continually emphasizes the distinction between the abstract and the concrete, which he uses in a sense peculiar to his philosophy.[55] In Hegel, any object may be viewed in such a way as to be abstract and isolated; likewise, any object may be viewed so as to be concrete. A term is abstract for Hegel

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52. Note Encyclopädie, 305, where Hegel distinguishes truth from correctness. Cf. his discussion of truth, Encyclopädie, 51-53; also 245, with reference to what he means by "untruth".

53. Hegel, SOL, 62.

54. Hegel, HP, II, 221-223.

55. Cf. Royce, in DPP, 457.

when it is considered apart from the relationships with which it belongs. A term is concrete when it is viewed within the whole of which it is a part. The distinction arises from Hegel's conception of the true as the whole, and thus a term which is abstract can be untrue because separated from the whole which makes it true. For example, when dealing with the moments of the subjective notion, he says:

> No complaint is oftener made against the notion than that it is abstract. Of course it is abstract, if abstract means that the medium in which the notion exists is thought in general and not the sensible thing in its empirical concreteness. It is abstract also, because the notion falls short of the idea.[56]

Any term is abstract when it is considered in isolation. Only when a term includes all its possible relationships to the rest of reality does it become concrete. Thus his distinction between an abstract universal and a concrete universal. An abstract universal is any general concept that is out of the specific connections with which it belongs; for example, "man", "hen", etc. A concrete universal is an individual whole in which the whole dominates all of its parts; for example, "a man", "a hen", etc. It should be noted that the terms abstract and concrete are relative terms; the progression of thought is always from the abstract toward the more concrete. As will be seen, the most abstract conception possible is that of mere being, apart from any statement as to the nature of such being. But thought is forced, by its very nature, to move from abstraction toward the more concrete, in which

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56. Hegel, Encyclopädie, 295.

being is seen to involve relationships of various kinds. Any term is relatively abstract with reference to a more concrete term, and relatively concrete with reference to a more abstract term. Only the Absolute is truly concrete because it is totality. Hegel has the distinction between abstract and concrete in mind when he refers to the Absolute as an "abstract generality" if it is conceived of and expressed in abstraction or isolation from its real nature which consists in its being objective to itself, and conscious of itself.[57]

(4) The true is a dialectical development, discovered in experience. Thinking must start somewhere, and the place where it starts Hegel calls the thesis. From this point thinking is always forced to move on to something else which is different from the thesis; this Hegel calls the antithesis. The interrelation of thesis and antithesis produces a new whole with entirely new properties, which Hegel calls the synthesis, and which he considers to be the logically necessary outcome of the movement of thought. The whole process is called dialectic, which will be more completely discussed under Hegel's treatment of the categories. The process is not wholly and only rational, but empirical as well, for Hegel discovers its operation in the survey of experience made in the Phenomenology.

These presuppositions may all be denoted as elements of "the true". They are not to be considered as distinct from one another, for a

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57. Hegel, POM, 16-17.

study of Hegel's system indicates that they are all aspects of the Absolute Truth, and therefore reappear at every stage of his thought. In examining the Hegelian treatment of the categories, we shall see that they all have a part in the general unfolding of the logical argument, and that they are in reality inseparable from one another.

CHAPTER FOUR

THE HEGELIAN TREATMENT OF THE CATEGORIES

The term "category" is a term borrowed from the ancient Greek courts of law. It is derived from the preposition κατά, down or against (the latter being basic to the definition of category), and from the noun ἀγορία, court or market-place. The word literally signified an accusation brought against a person, and came to denote a fundamental proposition of any kind. In ancient usage it was used in two senses: (1) in a general sense as simply a predication or attribution; and (2) in a restricted sense, as a term denoting classes of very wide extension.

Ledger Wood, in defining category, gives both a "realistic" and a "conceptualistic" definition of it. In realistic terms, a category may be defined as "an ultimate and irreducible universal, a universal which can neither be resolved into nor subsumed under a higher universal".[1]

Because this definition tends to remove the categories from the existential world, an alternative definition is desirable. He therefore adopts what he calls the "conceptualistic" or "constructional" view of the categories, which he gives as follows: "A category is a concept of high generality and wide application fabricated by the mind with direct or indirect reference to the experiential world and employed by the mind

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1. Wood, AK, 145.

in the interpretation of that world".[2]

Bowne defines the categories as "the immanent mental principles which underlie articulate experience and make it possible".[3] The point in both of these definitions is that the categories are the norms or standards by which the mind proceeds in fixing, defining, and relating its objects. Thought is to a very great extent a relating activity. Relations are instituted by thought and are objective expressions of those principles immanent in thought itself. The categories do not exist among sensations as mental states; they are the form which the mind gives to its experience in passing from impressions to objects, and in relating them. The categories, therefore, constitute the framework of thought and form the content of pure reason.

Categories differ from general concepts by their relation to what is called a "universe of discourse". Principles without which a given universe of discourse is impossible are categories for that universe. For example, the physical law of falling bodies is a general concept, but it is not necessary for a physical world. A physical world is conceivable in which some other law might operate. Space, on the other hand, is necessary to any conception of the physical world, and therefore it is a category. Since the categories pertain to the characteristics of objects which are essential to the very existence of those objects, the doctrine of the categories has had an important place in every philosophi-

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2. Wood, AK, 152.
3. Bowne, TTK, 59.

cal system, for without them, existence cannot be conceived.

In Aristotle's collection of extant works, the treatise Categoriae is usually listed first, and the doctrine of the categories is everywhere, in his writings, presupposed as established. There has been must controversy over the essential meaning of the doctrine, for Aristotle nowhere tells us of any definite principle used in the deduction of the categories.[4] But in its form, the doctrine seems to be a classification of the meanings of (or the things meant by) uncombined terms. In other words, it is an inventory of the main aspects of reality, at least in so far as language takes account of them.[5] The categories express reality, and not just "concepts" or "ideas".

Some have thought that Aristotle derived his categories from the grammar of language, and would support their contention by the fact that he designates the various categories by parts of speech. A reading of the Categoriae would seem to indicate that there is some dependence upon language for the derivation of his categories, but to assert this as a fact would require a complete knowledge of Aristotle's philosophy of language.[6] Accordingly, regardless of the method by which he obtained

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4. Ross, ARI, 22. Cf. Grote, ARI, 76.
5. Cf. MET, IV, 7, where they are viewed from a metaphysical standpoint as defining reality.
6. Cf. Grote, ARI, 99-100, and his reasons for concurring in the view of Trendelenburg that Aristotle derived his categories from the grammar of language, or at least from the distinctions between parts of speech.
Cf. also, Ross, ARI, 22, where he writes: "It is easy to see that a study of the forms of language was one of Aristotle's main guides in the formulation of the doctrine. ...But he had no list of the parts of speech on which he could base a list of categories; the only parts of speech which he recognizes as such are the noun and the verb. And the doctrine of the categories brings together things which grammar separates, and separates things which grammar brings together".

them, it remains that they are his mode of analyzing the terms of possible propositions. The number of categories is variously given in Aristotle's works, but the most common number is ten: Substance, Quantity, Quality, Relation, Place, Time, Position, State, Action, and Passion. In terms of parts of speech, under the heading of Substance come nouns, which may be either the subject or predicate of a proposition; Quantity, Quality, and Relation are denoted by adjectives which include these properties; Position, State, Action, and Passion are all forms of the verb, which is either the predicate of a proposition, or forms part of the predicate.[7]

These categories have been criticized by many thinkers and upon many differing grounds. Some hold they do not constitute a logical, but a metaphysical treatise. Others hold that the arbitrary way in which Aristotle insists upon the number "ten" is not backed up by any good reason. If the supreme category of Being is carefully considered, says Hamilton, it will be seen that Being is not characterized by these ten and no more, nor is it possible to characterize the ten categories as being separate and distinct classifications.[8] In addition, he holds that the first category, Substance, may be considered as Being-by-itself; and the rest are but accidents of Substance, and they overlap or flow into one another depending upon the way in which Substance is being viewed at the moment. A discussion of these objections would carry us

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7. In formal logic, the copula is either ignored, or is treated as part of the predicate.
8. Hamilton, LML, II, 141.

too far afield; they may be justified, or they may not. But if we, as Grote says, seek not to appreciate the value of the ten categories as a philosophical classification, but to understand what was in the mind of Aristotle when he framed them,[9] we shall see that his analysis of the categories depended upon an acceptance of a concrete individual as he stands, with his full array of possible predicates embodied in propositions, and he proceeds to analyze these propositions into their logical constituents. The categories derive their existence from being attached to a Subject, a concrete individual, and each one has a different mode of existence according as they are differently related to that Subject. For example:

> What is this individual, Sokrates? He is an animal. What is his Species? Man. What is the Differentia, limiting the Genus and constituting the Species? Rationality, two-footedness. What is his height and bulk? He is six feet high, and is of twelve-stone weight. What manner of man is he? He is flat-nosed, virtuous, patient, brave. In what relation does he stand to others? He is a father, a proprieter, a citizen, a general. What is he doing? He is digging his garden, ploughing his field. What is being done to him? He is being rubbed with oil, he is having his hair cut. Where is he? In the city, at home, in bed. When do you speak of him? As he is, at this moment, as he was, yesterday, last year. In what posture is he? He is lying down, sitting, standing up, kneeling, balancing on one leg. What is he wearing? He has a tunic, armour, shoes, gloves.[10]

The significance of this quotation is its illustration of the fact that, whatever a person or thing with which we are dealing, it

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9. Grote, ARI, 78.
10. Ibid., 77.

falls necessarily under each of the ten categories; it belongs to a certain genus, to a certain species; it is of a certain bulk and height; it has certain qualities; it stands in certain relations to other things; it is either doing something or suffering something; it is located in a certain place; it must be described in terms of a certain time; it is in a certain attitude or posture; and it is clothed or equipped in a certain manner. In other words, the categories apply to concrete individuals. Aristotle is not dealing with mere abstractions here; he intends to deal with reality also. The first distinction set forth in the Categoriae is that between matters predicated of a subject and matters predicated in a subject. The important thing to note is that a subject is requisite to the whole discussion.[11] The subjects are concrete, individual things or persons, such as Socrates, this man, that dog, etc. Substance, or Essence, in its complete state as concrete, individual, and determinate, is an embodiment of all these ten categories, the first being the subject of which the rest are predicated. Whatever question can be asked concerning any individual subject, the subject will fall under these ten categories.

The categories of Aristotle, therefore, may be defined as classifications, a posteriori, of the modes of objective or real existence. As such, they are not part of his logic, although they are presupposed by it. They are considered by Aristotle as "various meanings of being",[12] and as such they form a list of the fundamental kinds of real-

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11. Aristotle, Categoriae, I, a24.
12. Aristotle, MET, IV, 7.

ities with which the metaphysician must deal. Their significance for logic, however, lies in the fact that these categories, formulated into logical propositions, have a definite reference to reality. For Aristotle logic is not purely formal, in the sense of being apart from reality, as is often commonly supposed. It is true that logic deals with propositions in their abstract construction as forms by which the mind seeks truth, but as far as Aristotle's construction of the science is concerned, it is not something set apart from concrete reality.[13]

Among the most interesting tables of categories is the Kantian. Kant, in opposition to the Greek view, held that the objects of thought are nothing but the products of thought itself. Accordingly, over against the analytic logic of Aristotle he set his synthetic logic, in which the categories are regarded as the relating forms by which objects of thought arise. Kant used the categories to denote the *a priori* cognotions, or forms of thought, which are native and necessary to the mind itself, and which are not contingently derived from experience by an *a posteriori* process of generalization.

Thus, as Mary Calkins says:

> The Categories for Kant are the results of the mind's activity, - or better, they are activities of the mind. ...The Categories are, furthermore, like space and time relations, *a priori*, that is, independent of sense experience, universal and necessary.[14]

It is important to distinguish the "transcendental logic" of

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13. Cf. Grote, ARI, 108, where he notes that in both the *Categoriae* and *De Interpretatione* ontology is implicated with logic.
14. Calkins, PPP, 205.

Kant from the analytic logic of Aristotle. Knowledge for Kant is a synthesis, by which he means the "act of arranging different representations together, and of comprehending what is manifold in them under one form of knowledge".[15] The synthesis includes both that which is given empirically given by sense, and that given a priori by the understanding. But when the empirical is separated out of the synthesis, what is left is pure synthesis, which "in its most general meaning gives us the pure concept of the understanding".[16] These pure concepts of the understanding refer a priori to objects, and they are called "pure concepts of the understanding" because

> ...the same understanding, and by the same operations by which in concepts it achieves through analytical unity the logical form of a judgment, introduces also, through the synthetical unity of the manifold in intuition, a transcendental element into its representations.[17]

Borrowing the term from Aristotle, Kant calls these pure concepts of the understanding categories. The defects of Aristotelian analytic logic are recognized by Kant in his own transcendental logic,[18] yet he accepted one thing in common with Aristotelian logic - the science of judgment. Upon the traditional table of judgments he bases his table of the categories. Understanding by category the object of thought, he argues that all thought is judgment, and therefore there must be as many sorts of categories as there are sorts of judgments. Thus, Kant says:

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15. Kant, CPR, 64.
16. Ibid., 65.
17. Ibid., 66.
18. Cf. Smith, CKCPR, 184-185, where he lists the defects of traditional logic in detail, and also shows how Kant's final result is far from his professed reliance upon it.

> As all acts of the understanding can be reduced to judgments, the understanding may be defined as the faculty of judging. ...The functions of the understanding can be discovered in their completeness, if it is possible to represent the functions of unity in judgments.[19]

The deduction of the Kantian categories rests therefore upon the general principle that all acts of the understanding are judgments, and that the possible ultimate a priori forms of the understanding are identical with the traditional forms of judgment. Thus the categories of Kant appear as follows:[20]

1. Quantity

Judgments	Categories
a. Universal	a. Unity
b. Particular	b. Multiplicity
c. Individual	c. Totality

2. Quality

Judgments	Categories
a. Affirmative	a. Reality
b. Negative	b. Negation
c. Infinite	c. Limitation

3. Relation

Judgments	Categories
a. Categorical	a. Inherence & Subsistence (Substance & Accident)
b. Hypothetical	b. Causality & Dependence
c. Disjunctive	c. Reciprocity

4. Modality

Judgments	Categories
a. Problematic	a. Possibility & Impossibility
b. Assertoric	b. Existence & Non-existence
c. Apodictic	c. Necessity & Contingency

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19. Kant, CPR, 57.
20. Cf. Ibid., 58, and 66-67.

It is to be noted here that Kant considered this table of the categories to be complete; he always has exactly twelve categories, no more, no less.

> There arise exactly so many pure concepts of the understanding which refer a priori to objects of intuition in general, as there were in our table logical functions in all possible judgments, because these functions completely exhaust the understanding, and comprehend every one of its faculties.[21]

But Kant's deduction of the categories is open to serious objections. "This principle of classification, as has been objected to by most of Kant's critics, is at fault in the following way: it too uncritically assumes the adequacy of traditional logic to express all the metaphysically important classes of judgments".[22] Kant placed too great a reliance upon the finality of the traditional classification of judgments. While Kant maintained that the table was complete, he was forced to make changes in the table of judgments in order to make it yield the categories he felt were required.[23] Thus Smith characterizes Kant's "deduction" of the categories as "laboured, arbitrary, and self-contradictory".[24] Their construction is therefore artificial, loose in the relations between the forms of judgment and the categories, and the categories themselves are therefore unequal in value. All of these considerations make their "deduction" by Kant invalid.

The metaphysical implication of Kant's categories are important,

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21. Kant, CPR, 66.
22. Calkins, PPP, 553.
23. Cf. Smith's treatment of the category of Quantity, CKCPR, 184.
24. Ibid., 191.

especially in relation to the categories of Hegel. Since the categories are only the mental forms for relating and are in themselves empty, they can refer to an object only through the medium of perceptions. In other words, the only object of human knowledge is phenomenal appearance, and Kant's metaphysics can be only a metaphysics of phenomena. Only what appears can be known, for phenomena appear so because of the creative construction by the a priori categories of the understanding. Knowledge of "things-in-themselves" is impossible. The sole reason for asserting the categories to be valid throughout experience is that they are indispensably necessary for rendering it possible.[25]

Comparing the categories of Aristotle and of Kant, we find that the main difference between them is to be found in the fact that "Kant starts from the subjective side, considering the categories first as forms of conscious judging, whereas Aristotle - herein followed by Hegel - regards the categories as relations of the objects of knowledge".[26] The criticism Hegel applies to the "metaphysics of the past"[27] applies also to the categories of Kant. "It entertains an unquestioning belief that reflection is the means of ascertaining the truth, and of bringing objects before the mind as they really are".[28] In other words, as a metaphysics, such a mode of thought took the laws and forms of thought to be the fundamental laws and forms of things, and assumed that a knowledge of the Absolute could be acquired by assigning the categories of thought to

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25. Smith, CKCPR, 260.
26. Calkins, PPP, 552.
27. Hegel, Encyclopädie, 60-75. He refers here to the metaphysics of Wolff.
28. Ibid., 60.

it. Hegel objects to this type of metaphysics on the ground that it "never went beyond the province of the analytic understanding. Without preliminary inquiry it adopted the abstract categories of thought and let them rank as predicates of truth".[29] Such categories are, therefore, purely analytic, external predicates which are applied in a purely external relation to reality. The categories in such a case are not expressions of the truth (the whole of reality), but are only limited formulae of the understanding which merely impose a limit upon reality. They treat reality as simple, whereas it is complex. To have a genuine cognition of reality, the object of thought must characterize its own self, and not derive its predicates from without.

In the case of the Kantian categories, they are subjective, and they absorb into their meaning all that is ordinarily meant by objectivity. While Kant characterizes them as synthetic, the synthesis is still only an external relation to reality - the synthesis has not been carried far enough. In common with Empiricism, the critical philosophy of Kant emphasizes the great principle that whatever is true must be in the actual world and present to sense. But this emphasis, it must be remembered, results in a denial of the super-sensible, or at least a denial of any knowledge of it which would define its nature. It leaves thought no powers except those of abstraction and formal universality and identity. The emphasis is upon analysis which, far from leaving objects as they appear in experience, really transforms objects which are concrete into

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29. Hegel, Encyplopädie, 62.

mere abstractions. Thus, while such a view does establish the differences in things, these differences are nothing but abstract attributes, or thoughts.

> These thoughts, it is assumed, contain the real essence of the objects, and thus once more we see the axiom of by-gone metaphysics reappear, that the truth of things lies in thought.[30]

It follows that the categories are no fit terms for the expression of the Absolute, "the Absolute not being given in perception; - and Understanding, or knowledge by means of the categories, is consequently incapable of knowing the Things-in-themselves".[31]

Hegel assigns to Kant's philosophy one negative merit: it emphasizes the fact that the categories of understanding are finite in their range, and that any cognitive process confined to them falls short of revealing the truth.

> But Kant had only a sight of half the truth. He explained the finite nature of the categories to mean that they were subjective only, valid only for our thought, from which the thing-in-itself was divided by an impassable gulf. In fact, however, it is not because they are subjective, that the categories are finite; they are finite by their very nature, and it is on their own selves that it is requisite to exhibit their finitude.[32]

Kant's mistake lay in assuming that truth can be contained within the scope of the categories of the understanding, and the result was

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30. Hegel, Encyclopädie, 80.
31. Ibid., 91.
32. Ibid., 119.

that he produced only a historical description of thought; a mere enumeration of the factors of consciousness. The enumeration may be correct, but the universal necessity of what is thus empirically brought together is nowhere demonstrated conclusively.[33] Kant's conclusion is justified in so far as all finite thinking is concerned with appearances; but for Hegel the terminus of thought is not the phenomenal world - there is another and higher region which Kant's system made inaccessible to him.

The lack of a principle sufficient to secure the exhaustiveness of the table of categories led Hegel, among others, to attempt to deduce a table of categories from some single principle constitutive of the thinking process and of reality as a whole.[34]

Hegel conceived that three fundamental principles should hold of all philosophy:

> ...that it should be the complete exposition of the knowledge of the Absolute, that the system of such knowledge should be determined by the inner connexion of its content, and that the nature of the Absolute should be shown to be Mind, Spirit (Geist).[35]

These principles are for Hegel fundamental assumptions which must be held by those who seek to fulfill the task of philosophy. If it is true that all that is real or actual is the manifestation of the Absolute Spirit or Mind, then metaphysics coincides with logic. Logic thus has as its purpose the exhibition of the development of the creative

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33. Cf. Smith, CKCPR, 260.
34. Royce, in DPP, 453.
35. Baillie, OSHL, 119.

self-movement of Spirit as a dialectical necessity. The conceptions into which Mind or Spirit takes apart and analyzes its own content are the categories of reality; the task of philosophy is to comprehend these categories as moments of a single, necessary, unitary development. In this are the categories of Hegel to be sharply distinguished from those of Aristotle and Kant. Hegel's method is synthetic as over against the analytic method of both Aristotle and Kant.

Aristotle's categories were characterized by no principle of necessity in their deduction, and were applied externally to reality. Kant, on the other hand, in applying the categories to reality, made reality subjective, and his deduction of the categories was characterized as necessary only to the extent to which the categories made knowledge possible. Objective knowledge was something apart from the knowledge the categories give us. But Hegel's conception of truth as the whole makes such categories untrue. Thus Hegel says:

> If the thought-forms are vitiated by a fixed antithesis, i.e. if they are only of a finite character, they are unsuitable for the self-centred universe of truth, and truth can find no adequate receptacle in thought. Such thought, which can produce only limited and partial categories and proceed by their means, is what in the stricter sense of the word is termed understanding. The finitude, further, of these categories lies in two points. Firstly, they are only subjective, and the antithesis of an objective clings permanently to them. Secondly, they are always of restricted content, and so persist in antithesis to one another and still more to the Absolute.[36]

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36. Hegel, Encyclopädie, 58.

Criticism of the forms of common understanding has the result that these forms "have no applicability to things-in-themselves. This can have no other meaning than that the Forms are in themselves untrue".[37]

If the fundamental assumptions of Hegelian philosophy are to be demonstrated, therefore, new categories characterized by two requirements must be found: (1) they must give expression to the natural movement of subjective thought; and (2) they must be definitions of objective reality as well. In addition, the categories must be determined by a method which will show conclusively that they follow from necessity, both from the nature of thought and also from the nature of reality. This method, then, in the light of the above-mentioned fundamental assumptions must accomplish three things: (1) it must be a method which will result in a complete exposition of the Absolute; (2) it must be a method which will show the nature of the Absolute to be mind; and (3) it must be a method which will show the entire system of philosophy to be determined by the <u>inner</u> connection of its content.

In beginning the logic proper, Hegel points out that the categories of the logic "may be looked upon as definition of the Absolute, or metaphysical definitions of God".[38] By a "metaphysical definition", Hegel means that the categories of the logic are the expression of God's nature in thought as such. Every category, therefore, is to be evaluated in terms of its being one aspect of the Absolute, or universal Reason, and

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37. Hegel, SOL, 67.
38. Hegel, <u>Encyclopädie</u>, 156.

on that account as necessary to the whole. Hegel's categories are to be set over against the arbitrary, subjective categories of Kant. Since the categories are the definition of the objective Reason in the world, they are not, strictly speaking, so much "deduced" by Hegel as "discovered" by him. Hegel's deduction, therefore, is the discovery of the nature, order, and connection of the system of Reason which objectively is.

Stace points out that there are two questions confronting Hegel at the very beginning: What is to be the starting-point, i.e., the first category; and, what method is to be used to obtain the other categories from this first one?[39] If the deduction of the categories is to be shown to be logically necessary, the first category cannot be any arbitrary choice taken at random; since the categories are the objective process of reality itself, and since by "reality" universal Reason is meant,[40] it follows that the first category must be first necessarily. It is the category logically prior to all the others: the category of Being.

Hegel arrives at this category simply by examining his own reason and seeing which of all universal and necessary concepts is presupposed by, and logically prior to, all the others. "Pure Being", he says, "makes the beginning: because it is on the one hand pure thought, and on the other immediacy itself, simple and indeterminate; and the first beginning cannot be mediated by anything, or be further determined".[41]

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39. Stace, POH, 84.
40. Hegel, Encyclopädie, 172.
41. Ibid., 158.

Mediation for Hegel implies advance from an immediate idea through its antithesis to its synthesis, and hence the primary category must be entirely unmediated. With regard to concepts in general, the principle holds that the more universal is logically prior to the less universal, so that the latter is subsumed under the former. In other words, the more abstract and general a category, the earlier will be its position in the logic. The first category will be the most general of all. The starting-point of Hegel's logic is, therefore, the category of Being, for the concept of Being is the highest possible abstraction.[42] It is that concept which is common to every conceivable object in the universe; that which contains no determinations of any kind. Whatever object we choose to think about, it must always be true to say of it that it _is_. We can conceive of no object that does not have as one of its characteristics the category of Being. Being is thus presupposed by, and logically prior to, all the others, for the others are dependent upon it.

But having determined which category is to be the first, the problem of how the others are to be deduced from it arises. This problem is solved by the dialectical method, or by means of the _principle of dialectic_.

The principle of dialectic, which Royce calls "the fundamental paradox of our consciousness";[43] is the principle whereby the deduction of

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42. It is interesting to note that Hegel begins with the Absolute of the Eleatics, of Spinoza, and of Schelling. One of the purposes of his logic is to show the impossibility of such an Absolute; Hegel, _Encyclopädie_, 158-159. Cf. Harris, HL, 125.

43. Royce, SMP, 203.

the Hegelian categories is accomplished according to logical necessity. The idea in germ is borrowed from Aristotle's conception of the logical priority of the universal.[44] According to Aristotle, the form, or universal of a thing is also its end or purpose; and since the end or purpose of a thing is the reason why a thing exists, it is logically prior to the existence of that thing. The object in the world depends, logically, upon the universal for its existence. This idea is utilized by Hegel in the deduction of his categories. To quote Stace:

> The universal is the source of all existence. But the dependence of the world upon the universal is not a causal, but a logical, dependence. In other words, the world flows from the universal, not as an effect flows from its cause in time, but as a conclusion flows from its premises.[45]

The method used by Hegel, it should be pointed out, has not been invented by him; it has been discovered as the logical principle inherent in all reasoning. Deduction of the categories presupposes getting the higher categories out of the lower ones, and if so they must be contained in them somehow. They must be connected logically and necessarily by the very process of reasoning itself. This process Hegel does not invent, but discovers in his analysis of human consciousness in the Phenomenology.[46] In the introduction to his Science of Logic, Hegel says:

> In order that these dead bones of Logic may be revivified by Mind, and endowed with content and coherence, its method must be that by means of which alone Logic is capable of becoming a pure Science. ...The exposition of that which alone is capable of being the true method of philosophic Science belongs to Logic itself. ...since method

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44. Stace, POH, 21.
45. Ibid., 22.
46. Hegel, Encyclopädie, 58.

> is the consciousness of the form taken by the inner spontaneous movement of the content of Logic. In the Phenomenology of Spirit I have set out an example of this method as applied to a more concrete object, namely, to consciousness. We have here modes of consciousness each of which in realizing itself abolishes itself, has its own negation as its result, - and thus passes over into a higher mode. The one and only thing for securing scientific progress... - is knowledge of the logical precept that Negation is just as much Affirmation as Negation, or that which is self-contradictory resolves itself not into nullity, into abstract Nothingness, but essentially only into the negation of its particular content, that such negation is not an all-embracing Negation, but is the negation of a definite somewhat which abolishes itself, and thus is a definite negation, it has a content. It is a new concept, but a higher, richer concept than that which preceded; for it has been enriched by the negation or opposite of that preceding concept, and thus contains it, but contains also more than it, and is the unity of it and its opposite.[47]

In this passage, two important considerations are to be noted. The first is: the principle that all negation is determination is basic to the whole method of Hegel. Spinoza had laid down the principle that all determination is negation; and while, as Stace points out,[48] formal logicians will remind us that Spinoza's proposition cannot be simply converted, negation is, as a matter of experience, the very essence of positive being,[49] "A thing is what it is, only in and by reason of its

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47. Hegel, SOL, 64-65. The Phenomenology is Hegel's survey of experience; the basic experience out of whch Hegel derives his system is the experience of love. Dr. Brightman, in a Seminar in Hegel's Logic at Boston University (1946-1947) stated that he attended a lecture in Germany in which the philosopher Haering had noted this fact. Cf. the interesting statement in the Phenomenology, where Hegel says: "The life of God and divine intelligence, then, can, if we like, be spoken of as love disporting with itself"; Hegel, POM, 16-17.

48. Stace, POH, 33.

49. Hegel, Encyclopädie, 171-173.

limit".[50] By determination is meant definition, for the German verb bestimmen includes both meanings, the latter being submerged in its English equivalent. To define a thing is to set boundaries about it; to cut it off from some sphere of being, and therefore to limit it. To affirm that a thing lies within certain limits is to deny that it is outside those limits. Whatever is said of a thing by way of setting it apart always denies something else of it. For Hegel, negation involves affirmation, and affirmation involves negation, and thus both are correlatives which mutually involve each other. If, therefore, all determination is negation, it follows that the positive nature of a thing consists in its negations. Negation is, therefore, the very essence of positive being, for nothing can be stated about any object without involving the rest of the universe in the statement.

In the second place, the primary consideration, with respect to which negation is of secondary importance, is the fact of the synthesis of two opposing conceptions. As McTaggart says, "The really fundamental aspect of the dialectic is not the tendency of the finite category to negate itself but to complete itself".[51]

Kant had discovered that whenever reason attempts to treat the universe as an object of knowledge, propositions which are mutually contradictory can be maintained with equal right. The analysis of experience shows that, as soon as the mind attempts to go beyond phenomena, contradictories always arise in conceptual thinking, which contradictor-

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50. Hegel, Encyclopädie, 173.
51. McTaggart, SHD, 10.

ies are apparently necessary and irreconcilable. Kant thus says, in his chapter on "The Antinomy of Pure Reason", "Here we are met by a new phenomenon in human reason, namely, a perfectly natural Antithetic, which is not produced by artificial efforts, but into which reason falls by itself, and inevitably".[52] Kant worked out only four of the Antinomies,[53] as he called them, and Hegel criticizes Kant at this point for, as he says, "the Antinomies are not confined to the four special objects taken from Cosmology; they appear in all objects of every kind, in all conceptions, notions, and Ideas".[54] However, Kant did render a service to philosophy for he showed that the contradictions of thought spring directly from the necessity of the human mind itself. The antitheses and contradictions of thought belong to the nature of mind itself, and thus also to the essential nature of the reality which unfolds from it. Thus Hegel says,

> The problem of these Antinomies is no mere subjective piece of work oscillating between one set of grounds and another; it really serves to show that every abstract proposition of understanding, taken precisely as it is given, naturally veers round into its opposite.[55]

In addition, this characteristic of thought is universal in its operation, for Hegel emphasizes that "wherever there is movement, wherever there is life, wherever anything is carried into effect in the actual world, there Dialectic is at work".[56]

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52. Kant, CPR, 329.
53. Cf. Smith, CKCPR, 432, 519-520; Kant, CPR, 328-378.
54. Hegel, Encyclopädie, 99.
55. Ibid., 149.
56. Ibid., 148.

Kant was able to give no solution to this "problem of opposites",[57] and it was left for Hegel to show, in his Logic, that the truth of opposites consists in the systematic connection in which the categories follow from one another. Each receives its true value only when it is connected with the rest and is introduced into the whole. The dialectical method serves, with Hegel, to determine the essential nature of such opposing particular phenomena by the significance which they have as moments or links in the self-unfolding of the Absolute Reason.

> The opposites are not illusion, neither is unity illusion. The opposites are opposed to one another, but they are not opposed to unity. For true and concrete unity is nothing but the unity, or synthesis of opposites. It is not immobility, it is movement. It is not fixity, but development.[58]

Hegel regards unity and opposition as one-sided truths or fragments which merge into a synthesis, in which all three disappear, and a new unity with completely new characteristics appears. The dialectic is a movement, an evolution, of the "moments" of the Absolute totality, and the relation involved between them in the development of the new unity in the synthesis Hegel refers to by the German verb aufheben, which means that the moments are not only abolished, but at the same time preserved in a higher unity.

Logic is therefore the center of the Hegelian system. It is "neither more nor less than an expansion, completion and rectification of

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57. Cf. Smith, CKCPR, 432.
58. Croce, POH, 19-20.

Kant's table of the categories. In other words, it is a systematic grammar of thought - an analysis of the nature of our general conceptions and of their relations to one another".[59]

The operation of dialectic can be seen by examining Hegel's treatment of the Category of Being. Dialectic involves a process of mediation; a process by which an idea in its immediacy is overcome by reflection upon the idea and the mind moves toward the unity and completeness of the Absolute Idea by mastering the steps of mediation and removing them. Any idea of the mind, when first siezed upon, is lacking in relations to other ideas. Reflection upon a simple idea present to the mind discovers these relations one by one, and thus its structure is revealed. The act of reflection is the process of mediation, the movement of the dialectic, and is necessary and universal to all thought.

> Mediating is nothing but self-identity working itself out through an active, self-directed process. ...It is pure negativity, or, reduced to its utmost abstraction, a process of bare and simple becoming. ...We misconceive...the nature of reason if we exclude reflection or mediation from ultimate truth, and do not take it to be a moment of the Absolute.[60]

The true nature of thought is not to be found in its abstract forms, separated from the process of thought; the true nature of thought is a process in which thought is forced on to a knowledge of the

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59. Seth, HP, 89.
60. Hegel, POM, 18-19.

whole.

Hegel starts with the category of Being, because, as was pointed out above,[61] it is the simplest and most abstract of all possible categories. It has no character, and is entirely empty. But as such, it is equal to Nothing, for we can think of an object only by virtue of this or that determination. It is only by means of definite characteristics that an object can exist for thought. Since Being, by its very definition, is the absence of all determination, it is Nothing. Being and Nothing are therefore identical, and each passes into its opposite; a process which Hegel term Becoming.[62] But Becoming is the unity of Being and Nothing, and therefore, because of their identity, both cease to pass into each other. But this means that Becoming has collapsed into a unity of Being and Nothing. What we now have is a Being which does not become; a Being which does not at any time pass over into its opposite. As such, we can no longer say of it that it merely is; now it definitely is. It is determinate Being. "It is the definiteness of the Being which constitutes the new category".[63] Thus Hegel has arrived at the conception of a Being which has determination, although this determination is only the general idea of determination as such. The transition from this idea of abstract determination is now before us; "Determinate Being is Being with a character or mode - which simply is; and such un-mediated character is Quality".[64]

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61. Cf. 104-105.
62. Hegel, Encyclopädie, 163.
63. Stace, POH, 139.
64. Hegel, Encyclopädie, 170.

Quality, as the result of the process of thought, becomes the new starting-point from which the process of mediation continues as before. Thus, each category in the Hegelian system is evolved out of the preceding one, and each category is the unity of what precedes. Thought always begins with an idea immediately present to the mind. This idea is immediate, in Hegel's sense of the term, because it is perceived as a simple idea apart from its relations.[65] But whenever one thinks he is forced to go from the immediate idea to something else; he is forced to consider the neighboring territory, or, as Hegel terms it, its "other".[66] Thus, over against the thesis with which thought begins, there is the antithesis, or opposite. The two ideas are now externally related to each other as contradictories. The contradiction can only be overcome by including both in a more comprehensive concept, the synthesis. When this is done, the synthesis becomes a new thesis, which passes over into its antithesis, and both are once again included in a further synthesis. This process continues until thought has reached the Absolute Idea, which is seen to be the totality of all thought; the stage of thought at which all contradiction has been overcome, yet preserved, in the all-embracing unity of the whole. In each case, therefore, thought begins with a simple, immediate idea, and a new category is evolved when thought is forced to go beyond mere immediacy and to consider the external and internal relations of that idea.

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65. Cf. Hegel, Encyclopädie, 158, where he says, "the first beginning cannot be mediated by anything, or be further determined".
66. Ibid., 159.

This evolution, or development, of thought is the essence of the Hegelian dialectic. The deduction involved in the system is not the syllogistic deduction of formal logic; it is the demonstration of each category as belonging to, or being a member of, a whole. As such a whole it is not a class-whole, as is the case with syllogistic logic, but an organic whole including in itself all the relations existent in reality. By this method of deduction Hegel deduces his categories, with their sub-categories, as a logical necessity resulting from the very nature of the thought-process itself. There are three of these categories:

(1) The Category of Sein (Being), with the sub-categories of Quality, Quantity, and Measure. This is the stage of immediacy, the area of sensation (Sinnlichkeit).

(2) The Category of Wesen (Essence), with the sub-categories of Ground of Existence, Appearance, and Actuality. This is the stage of external relations, the area of the understanding (Verstand). It is on this level that Kant's categories are properly located. They do not involve the inner connection of reality, but only the external relations of thought to reality.[67] They deal with finite thinking, and are concerned with appearance only. But Hegel recognizes that the stage of appearance - the phenomenal world - is not the terminus of thought; there is another and higher region. This corresponds to Hegel's third category:

(3) The Category of Begriff (Concept), with the sub-categories of Subject, Object, and Idea. This is the stage of internal relations,

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67. Cf. Hegel, Encyclopädie, 119.

the area of reason (Vernunft). This is the stage of philosophic adequacy, of the comprehension of the whole.

Thought, therefore, is a dialectical development from the area of sensation and immediacy through the area of external relations to the area of internal relations; it is a dialectical development from the abstract to the more concrete, finding its completion in the Absolute Idea, which is wholly concrete because it is totality. The various categories of human thought - Quality, Quantity, Measure, Form, Content, Causality, etc. - all are stages in the self-expression of our thought-activity. Each category, however, is not the whole - is not the truth. Each one is a necessary, but abstract and untrue, expression of the total nature of things. Each category is the truth, but it is not the whole truth. Each is a definition of the Absolute (God), but it is not the whole definition of the Absolute.[68] The last category expresses the truth only in so far as it explicitly includes in itself the totality of all the other categories. To remain on any lower level of thought without moving in thought toward the Absolute Idea is to remain on a level which is inadequate as an expression of the truth. The progression of thought must be from the abstract to the more concrete, and is more concrete only as it approaches the totality of the Absolute Idea.

Logic, then, Hegel defines as "the science of the pure Idea; pure, that is, because the Idea is in the abstract medium of thought".[69] Logic is abstract because it is devoid of everything but the principles

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68. Cf. Hegel, Encyclopädie, 156, 207.
69. Ibid., 30.

of thought. But although abstract, it is a logic of concreteness. It is abstract and yet concrete because it has been abstracted from the concrete experience of the Phenomenology.

But Hegel has stated that logic is "able to express the reality of things".[70] If logic is the science of the pure (abstract) Idea, how can it explain the essential nature of reality?

Royce says that in the Encyclopädie Hegel appears "as one attempting, like a modern Aristotle, the task of surveying the total result of human knowledge with reference to its unification in terms of an idealistic philosophy".[71] And such a survey was the result of his examination of experience in the Phenomenology, for when Hegel examined experience in the light of his proposed method for philosophy (dialectic), he found that he could not remain solely in the realm of subjective thought. Thus, he says,

> In my Phenomenology of the Spirit, which ...was at its publication described as the first part of the System of Philosophy, the method adopted was to begin with the first and simplest phase of mind, immediate consciousness, and to show how that stage gradually of necessity worked onward to the philosophical point of view, the necessity of that view being proved by the process. But in these circumstances it was impossible to restrict the quest to the mere form of consciousness. For the stage of philosophical knowledge is the richest in material and organisation, and therefore, as it comes before us in the shape of a result, it presupposed the existence of the concrete formations of consciousness, such as individual and social morality, art and

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70. Hegel, Encyclopädie, 30.
71. Royce, LMI, 214.

> religion. In the development of consciousness, which at first sight appears limited to the point of form only, there is thus at the same time included the development of the matter or of the objects discussed in the special branches of philosophy.[72]

Hegel's categories, therefore, are not a collection of isolated ideas which are found in the mind and applied, now one and now another, to reality (vs. Kant). They are not instruments which the mind uses, but elements of a whole in the unity of which the mind is. The movement in the logic is to trace the categories, logically in the abstract, up to the category of Absolute Idea, or self-consciousness.[73] This is the organic unity of all the other categories, all of which are deduced from a single principle - the self. Thus thought reaches intelligence both as the principle of unity in the world, and also as the empirical process by means of which that principle can be traced out in reality.[74]

The logic is purely a logic - it is not a metaphysics. It deals with abstract universals, with pure thought. The Absolute Idea of the logic is merely the "scheme or form of self-consciousness.[75] But in the Philosophy of Mind Hegel goes on to deal with realities, with facts of experience. Thus the Absolute Spirit is shown to be the one ultimately real existence of which the Absolute Idea of the logic is a description or definition.[76] The logic is not merely a logic of subjective thought;

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72. Hegel, Encyclopädie, 58-59.
73. Cf. Ibid., 287, where Hegel refers to the Absolute Idea as "the principle of all life [which] thus possesses...a character of thorough concreteness".
74. Royce, LMI, 157.
75. Seth, HP, 109.
76. Cf. Hegel, Encyclopädie, Sec. 553.

it is an absolute logic, and therefore at the same time it describes not only the forms of subjective thought, but the forms of objective reality as well.

The facts of experience are shown to be the concrete expressions of the abstract principles of the logic. "The concrete existence of the categories (in Nature and Spirit) is to be deduced from their essence or thought-nature; it is to be shown that they cannot not be".[77]

The point of departure of such an idealistic philosophy is experience.[78] From this point thought moves first toward the abstract, and then toward the concrete manifestation of the abstract in experience.

> Awakened, as it were, by this stimulus [experience], thought is vitally characterised by raising itself above the natural state of mind, above the senses and inferences from the senses into its own unadulterated element, and by assuming, accordingly, at first a stand-aloof and negative attitude towards the point from which it started. Through this state of antagonism to the phenomena of sense its first satisfaction is found in itself, in the Idea of the universal essence of these phenomena: as Idea (the Absolute or God) which may be more or less abstract. Meanwhile, on the other hand, the sciences, based on experience, exert upon the mind a stimulus to overcome the form in which their varied contents are presented, and to elevate these contents to the rank of necessary truth. For the facts of science have the aspect of a vast conglomerate, one thing coming side by side with another, as if they were merely given and presented, - as in short devoid of all essential or necessary connexion. In consequence of this stimulus thought is dragged out of its unrealized universality and its fancied or merely possible satisfaction, and impelled onwards to a

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77. Seth, HP, 118.
78. Hegel, Encyclopädie, 19.

> development from itself. On one hand this development only means that thought incorporates the contents of science, in all their specialty of detail as submitted. On the other it makes these contents imitate the action of the original creative thought, and present the aspect of a free evolution determined by the logic of the fact alone.[79]

Thus Hegel has indicated that logic cannot be content with the abstract forms of subjective knowing alone, but that thought, by its very nature, is forced to see concrete experience as constituted by the very form which the logic discloses. Thus his pregnant statement which follows: "If thought never gets further than the universality of the Ideas, as was perforce the case in the first philosophies (when the Eleatics never got beyond Being, or Heraclitus beyond Becoming), it is justly open to the charge of formalism".[80] Starting from experience, the fact that human finitude is itself a necessary part of the Absolute Truth is derived. "This proposition is identical with the assertion that the dialectical method is the true method of philosophy.[81] For Hegel, reality is the objectification of reason. The world is to be understood as the product of an unfolding principle wholly rational in nature, and truth can be defined only by taking into account a certain necessary totality of the diversities of experience. The unified totality of phenomena is itself the truth. There is no truth beyond phenomena, yet no single phenomenon constitutes the whole truth.

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79. Hegel, Encyclopädie, 19-20.
80. Ibid., 21.
81. Royce, LMI, 154-155.

The logic of Hegel, therefore, is not restricted to the mere thought-forms of the mind, but is expressive of the very structure of reality itself. The definition of Hegelian logic given by Harris expresses the true content of it when he says:

> Logic is the science of the principles, method, and system of what is universal and necessary in thought, and it unfolds or defines and criticizes all the elements of thought, from the simplest, shallowest and most rudimental up to the richest, most comprehensive and luminous idea to which philosophy has attained.[82]

Hegel's logic, as containing the principles of the only possible metaphysics, is described in grand terms by Royce, when he sums up the matter in these words:

> Each of these negative discoveries [in experience], however tragic from the point of view of the life, that is, of the idea or opinion or attitude concerned, is in fact also a positive discovery, a new revelation as to the interrelation of the mind and of things, a new proof that in the realm of experience subject and object are not to be sundered, and that their unity develops out of the very conflicts which appear to exist between them so long as their relations are imperfectly appreciated.[83]

In conclusion, it should be noted that there have been many criticisms of Hegel's deduction of the categories, most of which have been criticisms of the detail, and of the deduction of certain specific categories.[84] These criticisms are beyond the scope of this work, but

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82. Harris, HL, 19.
83. Royce, LMI, 215.
84. In this connection, see Stace, POH, 172; McTaggart, CHL, *passim*; and especially, McTaggart, SHD, 75-120.

in defence of Hegel no better word can be spoken than that which he himself speaks in the introduction to his Science of Logic, when he says:

> I could not of course imagine that the Method which in this system of Logic I have followed - or rather which this System follows of itself - is not capable of much improvement, of much elaboration in detail, but at the same time I know that it is the only true Method. This is already evident from the fact that the Method is in no ways different from its object and content; - for it is the content in itself, the Dialectic which it has in itself, that moves it on.[85]

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85. Hegel, SOL, 65.

CHAPTER FIVE

HEGELIAN AND SYLLOGISTIC LOGIC COMPARED

Our study has shown that Hegel's logic goes far beyond the traditional logic both in scope of treatment and in final result. Its emphasis lies not upon determining a few fundamental principles of thought, but rather upon determining the ultimate nature of all thought as basic to the very structure of the universe itself. Hegel objected to traditional logic on the ground of its inadequacy to express the whole truth.[1] For Hegel, traditional logic was all right as far as it went, but it didn't go far enough.

Hegel shows his appreciation of formal logic in a passage in the Encyclopädie:

> Nor is it unimportant to study thought even as a subjective energy. A detailed analysis of its nature would exhibit rules and laws, a knowledge of which is derived from experience. A treatment of the laws of thought, from this point of view, used once to form the body of logical science. Of that science Aristotle was the founder. He succeeded in assigning to thought what properly belongs to it. Our thought is extremely concrete; but in its composite contents we must distinguish the part that properly belongs to thought, or the abstract mode of its action. A subtle spiritual bond, consisting in the agency of thought, is what gives unity to all these contents, and it was this bond, the form as form, that Aristotle noted and described. ...The purport of the science is to become

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1. Cf. 77.

> acquainted with the procedure of finite thought: and, if it is adapted to its presupposed object, the science is entitled to be styled correct.[2]

In his History of Philosophy, Hegel admits the tremendous contribution Aristotle has made in his formal logic, and says that "Aristotle has rendered a never-ending service in having recognized and determined the forms which thought assumes within us".[3] But he goes on to criticize that logic for being formal and abstract, and for that reason inadequate as an expression of the whole truth. Because of this inadequacy, it needs to be reinforced by a new logic which will overcome this deficiency of the older logic.

In evaluating this criticism, two questions must be kept in mind: First, what does Hegel mean by "truth"? Second, what does Hegel mean by "formal" and "abstract"?

In answer to the first question, our study has shown that truth for Hegel does not involve mere consistency, but also coherence. Truth is not a question of correctness,[4] but a question of the whole. No statement for Hegel is true unless it involves all its possible relationships to the whole of reality. The Hegelian emphasis is upon including in our view in the most coherent way the whole range of our judgments about experience. When, therefore, Hegel speaks of an object as being "untrue", he means by the term that it is considered as apart from all of its relationships to the rest of reality. This view of the true as being

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2. Hegel, Encyclopädie, 39-40.
3. Ibid., HP, II, 219.
4. Cf. Hegel, Encyclopädie, 305.

the whole is basic to Hegel's entire system, and to an understanding of it. Truth for Hegel means adequacy, and his objection to syllogistic logic as being inadequate is in reference to its ability to reveal or even to test the whole truth.

Keeping in mind, then, Hegel's essential meaning of truth, we can understand more clearly the apparent contradiction between what he says of traditional logic above,[5] and what he says of it in the introduction to his Science of Logic: "it may be said that, both in Form and Content, as exhibited in the textbooks, Logic has become contemptible".[6]

At this point it is well to call attention to an impression that has been growing as a result of this study: the impression that the logic of Aristotle, and modern syllogistic and symbolic logic are identified to such an extent that the criticisms that may properly apply to the latter apply also to the former. It is to be emphasized that we have primarily in mind the comparison of Aristotle's formal logic with that of Hegel, not a comparison of Hegel's logic with some modern extension of formal logic. We need to recognize that Hegel is frequently harsh beyond justification with Aristotle's logic, and that all of the criticisms he applies to it are not to be taken literally as they are made. It must be remembered that Hegel is emphasizing a particular conception of the purpose of logic, and that this emphasis influences his view of the opposing logic.

In our study of Aristotle's logic[7] we noted that truth for

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5. Cf. 122-123.
6. Hegel, SOL, 62.
7. Cf. Chapter 2.

Aristotle means consistency. No statement which is inconsistent with itself and with reality can be true. What is necessary for us to do is to clear up a misunderstanding which has arisen between the two conceptions of truth, Hegel's and Aristotle's. Hegel would agree that statements must be consistent to be true; on the other hand, Hegel, it seems, over-emphasizes the fact that statements must also refer to reality. It is not to be thought that this over-emphasis is absolutely unjustified, but it does seem to produce the unwarranted conclusion that the formal logic over against which he places his own logic does not have a like reference to reality. It may be that the text-books of Hegel's day treated logic as a purely formal science, and divorced that science from any necessary connection with real things. It is obvious that such a thing can be done easily enough. But if so, it is not to be supposed that logic, as Aristotle formulated it, had no reference to reality. Study shows that Aristotle's logic was no less metaphysical than Hegel's. Aristotle's logic was meant to deal with the realities or reality of the world, and was not ultimately "pure" or formal".

Aristotle would never hold that his logic did not apply to reality. Aristotle was empirical in his method, and he based his conclusions upon observations from experience. When he established his logic, he had in mind not only the relations between ideas, but also the relations between things as they existed in the external world. In his Metaphysics, for example, Aristotle defines truth as obtaining when the mental conjunction of terms agrees with reality, and says, "he speaks falsely who, when either things are or when they are not, makes assertions

about them in a contrary way to that in which they actually subsist".[8] Aristotle's conception of logic, therefore, agrees closely with Hegel's conception of logic, and the main difference in their respective conceptions of truth lies not in the relationship of logic to reality, but in the Aristotelian emphasis upon consistency with other propositions and correspondence with perceived reality as a criterion for logical truth, and the Hegelian emphasis upon coherence as well. At this point Hegel does not disparage the Aristotelian principle of consistency, but supplements it by an appeal to coherence. When, therefore, Hegel speaks of syllogistic logic as untrue, it must always be remembered that he is speaking of it in terms of its inadequacy as an expression of the whole of reality. But it must not be assumed that Aristotle's formal logic has no reference to reality, for, if it had no such reference, it would be worthless as an instrument by which to determine the validity of our ideas about reality.

Now Hegel's essential meaning of truth brings to light what he means by the term "abstract". Abstract for Hegel does not mean, as we have seen above, that a given object is viewed as apart from the relationships with which it belongs. Since the true is the whole, an object is untrue only in the sense that it is separated from the whole which makes it true. When Hegel speaks of logic as "formal", however, it seems as if he does believe it to be apart from reality, and to deal with mere external forms of thought which are applied in a purely external way to reality.[9] In this sense, the criticism is justified, if we keep in

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8. Aristotle, MET, VIII, x, 249.
9. Cf. Hegel, SOL, 62.

mind Hegel's essential aim. Hegel is willing to credit formal logic with a certain kind of validity. In so far as formal logic restricts itself to the forms of thought about particulars as such, it fulfills its aim. As the science of the forms of finite thought, formal logic is adequate. But Hegel's aim in his logic is to go beyond the mere forms of finite or subjective thought, which in his opinion are untrue because inadequate, to absolute thought, in which thought is true because it contains thought in all its relations to the whole of reality.

Abstract and concrete were terms which were not in the philosophical vocabulary of Aristotle's day.[10] But Aristotle does make a distinction between ideas which are abstract, and concrete realities. If we are to describe the relation between abstract and concrete in Aristotle we must say that for him the abstract is <u>in</u> the concrete; the concrete contains or embodies the abstract.[11] As far as Aristotle was concerned, then, any abstract term has meaning only as it can be applied to a concrete individual.

The result of all this is the recognition of the fact that the distinction between Aristotelian logic and the logic of Hegel is not rooted in a metaphysical reference so much as it is rooted in a difference of metaphysics and approach. Hegel conceives reality as Thought and approaches it from the point of view of thought; Aristotle, on the other hand, approaches thought from the point of view of reality, In

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10. Cf. Grote, ARI, 64-65.
11. Cf. Aristotle, <u>Categoriae</u>, I.

both, the logic produced has a definite relation to real existence.

When, therefore, Hegel speaks of syllogistic logic as "abstract", "untrue", "inadequate", etc., he refers only to the fact that it deals with elements of thought apart from their relationships to the whole of reality. In no sense does he mean that traditional logic has no reference to reality.

We have seen, then, that Hegel criticizes syllogistic logic on the ground that it is inadequate as an expression of the whole truth, and therefore needs to be reinforced by a new logic which will overcome this deficiency of the older logic. But if traditional logic is inadequate to express the whole truth, the question arises: What position, if any, does traditional logic occupy in Hegel's logical system, and is it of any real value? Our answer to this question may be approached by noting the place Hegel gives to the so-called "Laws of Thought" - Identity, Contradiction, and Excluded Middle - and the Syllogism. These elements may be taken as fundamental to syllogistic logic, the former being the presuppositions upon which the latter, syllogism, is based.

In Hegel's view, formal logic begins with presuppositions which cannot be held to be adequate to the production of truth. Here, again, it is necessary to remember that truth for Hegel means the whole. Logic cannot take for granted any of the forms of reflection or rules and laws of thought for these are a part of the very fabric of logic and must be demonstrated within the boundaries of the science itself. In other words, "What Logic is cannot be set out beforehand - on the contrary this knowledge of what Logic is can only be reached as the end and consummation of

the whole treatment of the subject".[12] Hegel objects to presuppositions on the ground that formal logic, and all philosophy for that matter, still leaves unanswered the question as to <u>why</u> such presuppositions are true. They remain unexplained facts, and philosophy can never hope to explain anything if it starts from a mystery.[13] Hegel's aim in his logic is to show that the dialectical method is not subject to this objection. But does he? We have seen that Aristotle's presuppositions were drawn from the facts of experience; they were not arbitrary constructs. The process of distinction exemplified by the principle of identity is a fact of experience. But Hegel begins with a presupposition also, and he finds also that this presupposition is corroborated by the facts of experience. It would seem, therefore, that in this criticism of formal logic there is both a great truth, and also an error. The <u>truth</u> is Hegel's emphasis upon the movement of dialectic and the fact that merely to state the principle of identity does not get at the whole truth. On the other hand, Hegel appears to be somewhat illogical when he holds that the principles underlying formal logic involve unproved presuppositions, for Hegel himself also starts from a presupposition. The conclusion, then, must be that Hegel is being so dogmatic in his assertion of what he sees to be the truth that he appears to be too harsh with the logic he feels to be inadequate to the expression of that truth. This tendency to appear harsh in his judgment of syllogistic logic must be tempered by keeping in mind such passages as the following, in which Hegel says:

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12. Hegel, SOL, 53.
13. Ibid., <u>Encyclopädie</u>, 369.

> Aristotle has rendered a never-ending service in having recognized and determined the forms which thought assumes within us. For what interests us is the concrete thought immersed as it is in externalities; these forms constitute a net of eternal activity sunk within it, and the operation of setting in their places those fine threads which are drawn throughout everything is a masterpiece of empiricism, and this knowledge is absolutely valuable. ...The best of what is stated respecting the forms of judgment, conclusion, etc., in ordinary logic, is taken from the works of Aristotle: as far as details are concerned, much has been added to it, but the truth is to be found with Aristotle.[14]

Hegel's phrase, "net of eternal activity" is significant here. The wholism of Hegel's metaphysics is set over against the pluralism of Aristotle's metaphysics.

In the second place, formal logic, with its presupposition of the validity of the canon of identity or contradiction, is a work of the understanding, and reason as reflection is nullified thereby.[15] Logic, Hegel says, taken as the science of thinking in general, is understood as the bare form of cognition. It is considered as abstracted from all content, and considers that this content, which lies outside of the discipline, must be brought in and added to its conceptions to give it content. Note that Hegel says this is one conception of formal logic - he does not specifically state that this represents Aristotle's view of formal logic. But over against this conception of formal logic, Hegel places his own, in which he considers formal logic to be deficient in

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14. Hegel, HP, II, 219-220. Cf. above, 122.
15. Cf. Hegel, Encyclopädie, 368-369.

that it is all content and very little form.

> Here...we come across the drawback pertaining to the whole Aristotelian manner, as also to all succeeding logic...that in thought and in the movement of thought as such, the individual moments fall asunder; there are a number of kinds of judgment and conclusion, each of which is held to be independent, and is supposed to have absolute truth as such. Thus they are simply content, for they then have an indifferent, undistinguished existence, such as we see in the famous laws of contradiction...,etc. In this isolation they have, however, no truth; for their totality alone is the truth of thought because this totality is at once subjective and objective. Thus they are only the material of truth, the formless content: their deficiency is hence not that they are only forms but rather that form is lacking to them, and they are in too great a degree content.[16]

But in the conception of logic as the bare form of cognition, reason is renouncing itself, and thus the concept of truth is lost. "It is restricted to the cognition of merely subjective truth, of mere appearance, - <u>knowing</u> falls back into <u>opinion</u>".[17] This falling of <u>knowing</u> back into <u>opinion</u>, Hegel continues, contains the germ of the dialectic by which logic operates as true thought - the perception of the <u>necessary conflict</u> with each other of the determinations of the understanding. The immediate concrete must be transcended and must undergo determination and abstraction. But reflection must just as much transcend these its own separative determinations and forthwith relate them to each other.[18] In other words, Hegel stresses the fact that in ordin-

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16. Hegel, HP, II, 222-223. Note that here again Hegel is attacking the pluralism of Aristotle.
17. Ibid., SOL, 56.
18. Ibid., 56.

ary logic, the Aristotelian forms are only thought-determinations between which the understanding makes distinctions. "This, however", he says, "is not speculative thought; i.e., of reason as distinguished from understanding: for there the identity of the understanding which allows nothing to contradict itself is fundamental".[19]

Aristotelian logic is based upon the law of identity or contradiction, depending upon whether the principle is stated affirmatively or negatively. Both of these are expressions of the fundamental law of consistency,[20] whose logical significance lies in the fact that if there is to be any definition or affirmation possible, the character of notions or concepts must remain fixed. This, in Aristotle's view, is the highest law of thought. Unless a distinction can be maintained, thought becomes impossible. If A and non-A are the same, we cannot retain meaning even in the simplest statements.

Aristotle, therefore, started with the presupposition that every object is an identity. For example, if I speak of "this book", I am referring to "this book" in isolation from everything else that can be conceived. The operation of formal logic consists in putting an isolated idea like that of "this book" into relation with an idea of another object and drawing a conclusion from them based upon their inclusion in, or exclusion from, a class to which both belong. Its correct operation depends upon the fact that these objects can be set apart as identities in themselves. The traditional laws of thought are concerned, therefore,

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19. Hegel, SOL, 222.
20. Cf. above, 45-46.

with external relations, and are accordingly dealt with by Hegel in the sphere of Essence, which is the sphere of external relations; the sphere in which objects of thought are considered as self-identical, unrelated to each other except externally, and without opposites. When the principles of Essence, or external relations, are taken as essential principles of thought they find their expression in the universal laws of thought.

Much has been made of Hegel's "denial" of the laws of thought. Hegel nowhere categorically denies their validity; what he does do is to show that they are merely one-sided abstractions. The Law of Identity, for example, states: "Everything is identical with itself; A is A". Its converse states the opposite: "A cannot at the same time and in the same respect be both A and non-A". The Law of Excluded Middle emphasizes the fact that there can be no middle ground between the contradictories A and non-A. The Law of Identity is an abstraction that excludes all difference. The Law of Contradiction is an abstraction that excludes all identity. What Hegel points out is, forst, that each of these has no meaning without the other. The proposition, A is A, for example, is not properly a proposition at all. A proposition has as its aim the distinction between a subject and a predicate; the Law of Identity makes no such distinction. Thus Hegel says, (speaking of the Law of Identity):

> This maxim, instead of being a true law of thought, is nothing but the law of abstract understanding. The propositional form contradicts it: for a proposition always promises a distinction between subject and predicate, while the present one does not fulfill what its form requires.[21]

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21. Hegel, Encyclopädie, 213-214.

Again, the three laws of thought, taken as absolute, serve to nullify one another.

> The various propositions which are set up as absolute Laws of Thought are, more closely considered, opposed to one another, they contradict and cancel one another. - If everything is self-identical it is not distinguished; it contains no opposition and has no ground. Or when it is assumed that there are no two identical things, that is, each thing is different from every other, then A is not equal to A, A is therefore not opposite, and so on. If either of these propositions is assumed, the assumption of the other is barred. - A thoughtless consideration of these propositions enumerates them one after the other, so that they appear quite unrelated; it thinks only of their intro-reflectedness, without paying attention to their other moment, Positedness or their determinateness as such, which drags them forward to transition and their negation.[22]

In Hegel's view, then, the laws of thought are canons of the procedure of the understanding. All are on the stage of the development of mind at which it regards opposites as mutually exclusive and absolutely cut off from each other. Hegel's "denial" of these laws consists in the principle that each category contains, and <u>is</u>, its own opposite. But this is not a <u>denial</u> of the Law of Contradiction or of the Law of Identity because it is this law which compels thought to advance beyond the statements existing between thesis and antithesis to the synthesis. It is because reason cannot rest in external contradictions that thesis and antithesis must be resolved in the synthesis.

Hegel has no objection to these laws of thought if it is realized that they constitute one aspect or element of thought, and not its

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22. Hegel, SOL, II, 37.

whole nature. Thought is always distinction, but it is also relation. It both marks off and at the same time connects. Distinction depends upon relation, and an absolute distinction would destroy it. The Law of Identity or Contradiction must be qualified by the law which asserts the relativity of the thoughts distinguished. For understanding, the categories remain fixed, separated, static, and lifeless, each cut off completely from the others. For understanding, no deduction (in the Hegelian sense) is possible. "Neither in heaven nor in earth, neither in the world of mind nor of nature, is there anywhere such an abstract 'Either-or' as the understanding maintains".[23] Reason breaks up this schematism of the understanding and shows that the truth does not lie wholly in A, nor wholly in non-A, but in the synthesis of the two.[24]

Hegel's objection to understanding is not against the distinctions, nor that understanding has not its proper place. Again we come to the fundamental principle at the basis of his whole system: the true is the whole. The error of understanding is to imagine that the truth is the whole truth, that distinctions and oppositions are real, while identity in opposition is unreal. All Hegel means when he "denies" the Aristotelian laws of thought is their absolute validity.[25] If the world as intelligible is a world of distinction and individuality, it is also, as intelligible, a world of unity; for all difference presupposes a unity by which it can be measured. Thus, there are no absolute separations or

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23. Hegel, Encyclopädie, 223.
24. Cf. Ibid., 356.
25. Cf. McTaggart, CHL, 104.

oppositions that cannot be reconciled. Every definite assertion has a relation to its negative (A$\longleftrightarrow$non-A) from which it cannot be separated without losing its meaning. In the very definiteness with which it is asserted is a proof that its affirmation is not absolute. Hegel, therefore, does not oppose, but includes the Aristotelian principles in his thought, and draws from them the meaning implied by them.[26] He must utilize these principles to differentiate his thesis and antithesis, but he goes beyond them to include them in a larger whole, the synthesis. He therefore begins with Aristotle, and makes explicit what Aristotle did not, but what was implicit in Aristotle's logic all the while. For, Hegel says, the content of Aristotle's logic "is none other than the speculative Idea".[27]

When we come to the syllogism, we find that Hegel puts it on the highest stage of the dialectic, Begriff, as the subjective notion. It is essentially the process of reason mediating between thesis and antithesis and moving on to a synthesis.

The nature of syllogistic reasoning consists in this: A single proposition simply makes an assertion without stating the grounds on which it rests. A syllogism, however, justifies its conclusion by showing the premises from which it has been derived. It thus appeals to reason and compels assent. The premises in turn must rest in propositions whose truth everyone will accept, and syllogistic reasoning thus consists in showing how the truth of some proposition follows necessarily from other propositions whose truth is admitted.

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26. Cf. Hegel, Encyclopädie, 143.
27. Hegel, HP, II, 222.

The method by which this is accomplished is the process of mediation; a process by which a middle term common to two propositions acts as a bridge, or a connecting link, and makes possible a conclusion resulting from the connection of the two propositions through the middle term. It is important to remember that this process is not a mere linking of the words or terms of propositions, but the middle term represents the universal principle by which reasoning always reaches a conclusion from two prior propositions.[28] The logical argument is a process of comparison and the law of identity is fundamentally important here, for is the meaning of the terms does not remain fixed, no comparison is possible. The middle term is the important element of the syllogism, for it constitutes the mediating link between the major and minor terms and makes possible their union.

Upon the position of the middle term in the premises depends the Figure of the syllogism. Aristotle defines a syllogism as follows:

> When three terms are so related to one another that the last is included in the middle as in a whole and the middle is included or is not included in the first as in a whole, there is necessarily a perfect syllogism in connecting the extremes.[29]

This statement indicates that Aristotle's treatment is largely a quantitative one at the logical level. That is, each of the terms, including the middle term, represents a whole as well as just a class as such. The principle as formulated here is for Aristotle the principle upon which all syllogistic reasoning is based. There are four possible

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28. Creighton, IL, 137.
29. Aristotle, Analytica Priora, 25b, 32-35.

arrangements of the middle term, three of which were recognized by Aristotle:

First Figure	Second Figure	Third Figure
M - P	P - M	M - P
S - M	S - M	M - S
S - P	S - P	S - P

The first figure Aristotle refers to as a "perfect syllogism", illustrated by the definition given above. Aristotle himself says, "I call that a perfect syllogism which needs nothing other than what has been stated to make plain what necessarily follows".[30] The other two figures have no validity independent of the first. They are "imperfect" because the conclusions drawn from them do not follow directly from the premises, but from propositions which do follow immediately from them and which conform to the conditions of the first figure; i.e., to the dictum de omni et nullo.[31] For this reason, reduction to the first figure was, for many centuries, considered an integral part of the doctrine of the syllogism.[32] But with the rules of the syllogism it is now possible to decide the validity of arguments in any figure independently.

All of this indicates the character of the Aristotelian doctrine of the syllogism.[33] As may be expected by this time, Hegel objects to the traditional doctrine of the syllogism. Aristotelian logic is wholly empirical, says Hegel. It lists such and such kinds of judgments, syllo-

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30. Aristotle, Analytica Priora, 24b, 20-25.
31. Cf. above, 44.
32. Cf. Frye & Levi, RB, 277.
33. Cf. Hegel, Encyclopädie, 314-329, where he treats each figure of the syllogism in its relationship to the others as logically deduced from a preceding figure.

gisms, etc., but no reason is ever given for their arrangement except that things are related that way to each other in experience as it is formulated. They are derived from experience, it is true, and they represent the true nature of subjective thought, but they are not rationally connected into a system. They remain on the level of external relations, where thought is essentially static and lifeless. Thus, Hegel says:

> In this we get an empirical logic - surely an odd science, an irrational cognition of the rational. Logic thus affords a very bad example of obedience to its own lessons.[34]

Hegel accepts the syllogistic reasoning of Aristotle and then proceeds to deal with it according to the dialectical method. Its principles are not merely asserted, but logically deduced in the same manner as the rest of his logic, and logic is thus raised from a "heap of empirical facts to the level of a rational science, which, as the science of reason, it, above all others, surely ought to be".[35] For Hegel, notions, judgments, and syllogisms are not merely subjective forms of thought, and no more. They are parts of a universal whole, and can be understood as true only in reference to their relationship to the whole. Here again, emphasis is placed upon Hegel's basic proposition: the true is the whole. As the thesis of the highest stage of the dialectic, Begriff,[36] Hegel demonstrates that the syllogism comes under his notion of

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34. Hegel, DFL (Macran), 163.
35. Stace, POH, 226-227.
36. Note that there are less comprehensive categories in Hegel's logic, but that each is an expression of the truth only because of its relationship to the Absolute.

the self-unfolding of the Absolute (Middle Term!), and cannot remain as a purely subjective form of reasoning. The mind is forced to realize that the syllogism is expressive of objective nature as well.[37] For Hegel, the syllogism is not only the supreme form of human reasoning, but all of reality finds its expression in the form of syllogism.[38]

The foregoing examination of the logic of Aristotle and of Hegel indicates that the two logics are not as far apart in meaning as might at first be supposed. A summation of the principle antitheses between the two logics will emphasize this fact.

(1) The function of syllogistic reasoning is to draw conclusions from propositions by means of a middle term in which they participate or are included. Syllogistic logic is a logic of class-inclusion based on similarity, including difference. Hegel recognizes this function of the syllogism, and adapts it to his conception of thought as a dialectical movement. Hegel's is a logic of inclusion based on similarity-difference included in a higher unity. The syllogism is shown to be a necessary stage in the evolution of the absolute truth, and it represents the basic function of the mind. For both Aristotelian and Hegelian logic, the principle of mediation is basic. The difference between them comes in the method by which each accomplishes the mediation. In Aristotelian logic, mediation is accomplished by a term which is common to, and therefore mediates between, two other terms; a term which is, common with the

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37. Hegel, Encyclopädie, 328-329.
38. Ibid., 50.

others, a class whole (collective). Mediation consists in passing to a conclusion from two propositions whose common term is related to both of them by the principle of class-inclusion and class-exclusion. In the logic of Hegel, mediation is accomplished as an internal necessity of thought itself to include everything in an organic whole which includes classes as well. This is manifested in the tendency of the mind to seek to harmonize contradictions in a higher concept or synthesis, in which the contradictions are canceled, yet at the same time preserved.

(2) Syllogistic logic is atomistic and analytic. As such, it is involved with external relations, and mediation involves terms which are externally related. Hegel's logic, on the other hand, is organic and synoptic, and mediation involves internal relations. Syllogistic logic revolves around the principle of identity; Hegelian logic revolves around the idea of complement (dialectic). In syllogistic logic, external objects are not necessarily identical; in Hegelian logic the contradiction is internal, and the contradictories are not opposed except in thought. Hegel has a place for syllogistic logic, but he recognizes that it must be transcended.

(3) Syllogistic logic is abstract; but so also is Hegelian logic. The antithesis between the two logics in the matter of their relation to reality is only apparent. While Hegel consistently emphasizes that his logic expresses the underlying principles of reality, the logic of Aristotle seems to be set apart from reality; yet his metaphysics is constantly its underlying presupposition. The distinction between syllogistic logic, as Aristotle founded it and formulated it, and the

logic of Hegel is not so much a metaphysical difference as a difference in approach. Hegel appraoches reality from the point of view of thought; Aristotle approaches thought from the point of view of reality. In both, the logic produced has a definite relationship to real existence.

(4) Aristotelian logic and Hegelian logic differ in their criterion of truth. For formal logic, consistency is the criterion; for Hegelian logic the emphasis is upon coherence, which includes and at the same time transcends Aristotelian consistency. The logic of Aristotle is sterile; a concept one defined is static. In Hegelian logic, a concept, once defined, needs to be criticized. The logic of Aristotle, therefore, is static; analysis by class-inclusion by itself tells you only what you have. Hegelian logic, on the other hand, is an evolution or development; it is a movement of thought, and is therefore dynamic. The syllogistic logic of identity fixes the mind upon static relationships; the dynamic logic of contradiction and synthesis makes possible further advance in a knowledge of relations, and the production of new truth.

(5) The chief distinction between Hegelian and Aristotelian logic is in the Hegelian emphasis upon the whole as having properties which its parts do not have. The emphasis is Aristotelian logic is upon classes, and the distinction between Hegelian wholes and Aristotelian class-wholes should be kept in mind. A whole for Aristotle is a class; when he speaks of "dog", for example, he refers to dog as a class term which includes as its properties all that is characteristic of dogs as a class. The conception of "dog" as a class is a fixed conception; there is no reference to the properties which an individual dog may possess

that are not common to the class as a whole.

Hegel, on the other hand, would speak of "dog" with reference to the individual dog not only with reference to characteristics which it has in common with all other dogs, but also with reference to his relationship to all the rest of reality. The concept here is a dynamic one, and includes not only those characteristics common to "dog" as a class, but also all those relationships characteristic of this particular dog as distinct from all others. The emphasis in Aristotelian logic, therefore, is upon wholes as classes; the emphasis in Hegelian logic is upon wholes as organic wholes possessing properties which their parts do not have. The Aristotelian whole is a class-concept; the Hegelian whole is an organic concept. Aristotelian logic proceeds by the method of analysis to seek those characteristics by which a given object may be included in a class. Hegelian logic emphasizes the fact that analysis can never reveal the whole truth about anything; nothing less than a knowledge of all the relationships of an object to the rest of reality is adequate as an expression of the whole truth. Every synthesis is a synopsis - it has properties the thesis and antithesis do not have.

It should be noted here that the concept of the Hegelian whole creeps into "formal" logic in, for example, the idea of collective terms, and in connection with the fallacy of composition and division. Here Aristotle recognizes the properties which wholes have which their parts do not have.

If we were to be asked, then, as a result of our study of Hegelian and syllogistic logic: What is the ultimate significance of

Hegelian logic? the answer would be: Hegelian logic has emphasized the one thing that is integral to logic, and yet was not seen clearly until the time of Hegel - the properties of wholes which their parts do not have. The true is the whole, and anything less than a statement as adequate and as coherent as possible about any given object falls short of giving us the whole truth about that object.

CONCLUSION

In conclusion, the following summary indicates the main points brought out by this study in comparative logic.

(1) Logic received its first systematic exposition and formulation by Aristotle, although preparatory work had been done in this direction by earlier thinkers, most notably Socrates and Plato. Aristotle, basing his work upon contributions made by all previous thinkers, was the first philosopher to segregate the problem of thought as such from the other philosophic disciplines and to systematize the science of logic. The science has remained practically as Aristotle formulated it with the exception of a few minor corrections and additions. The development of modern logic has taken, in general, two forms: (1) modern symbolic or mathematical logic, which is a logic of high abstraction and generalization, and is a process of relating terms in equations irrespective of the subject matter involved; and (2) scientific or inductive logic, which is a logic based upon observation in experience and leading to the formulation of valid generalizations which make possible reliable scientific prediction. Based upon the methods of John Stuart Mill, and allied with the use of hypothesis and experimentation, inductive logic produces laws of high probability and leads to the modern ideal of science in which the concept of progress has taken the place of an ideal of a demonstrative science based upon immutable principles. By the use of inductive procedures science arrives at generalizations, and its aim is to extend

these generalizations to other areas of the phenomenal world. This is accomplished by the uniting of inductive and deductive methods of logical inquiry. The logic of Hegel, in spite of the fact that it aims at an exposition of the movement of subjective thought as well as of objective thought, is usually treated in logical history as a metaphysics rather than a logic. The result of the historical survey of logic is to indicate that Aristotle's deductive logic remains essentially the same as it was when Aristotle had finished a systematization of its principles, and that Hegel's logic is the only logic in direct antithesis to it.

(2) Aristotle made no definite attempt to locate his logic within his classification of the sciences. His logical treatises are set apart from his other works, and logic is treated as a propaedeutic which is properly a part of the general culture of everyone before he undertakes to study any science. The problem of formal logic is to determine the nature of the unchangeable principles governing all reasoning. The science gives us the answer to this problem, and nothing more. As a result of his analysis, Aristotle reaches the conclusion that the syllogism is fundamental to all reasoning. Fundamental to the syllogism is the principle of dictum de omni et nullo and the fundamental Laws of Thought. The basis of the whole system is the principle of class-inclusion. Validity in reasoning is obtained only when a given term can be shown to be included in or excluded from a more comprehensive class of which it is a member. Syllogistic logic is a logic of classes; a logic of consistency between propositions.

Syllogistic logic is subject to certain limitations. It has an

abstract and formal character. As a logic of consistency, anything can be true which is not self-contradictory. The problem of syllogistic logic is to show what combinations of concepts or judgments can be employed as premises which lead to valid conclusions in the syllogism. It deals with validating forms of inference, therefore, and shows these forms in abstraction from the particular subject matter to which they apply. Syllogistic logic, therefore, often results in an artificial separation of formal and material truth. It comes to its end in the statement of the principles of valid reasoning.

Secondly, the syllogism is not an instrument for the discovery of new truth; it brings to light only what is specifically implied in truths which are already known. It is restricted or limited to those premises already available to us. Modern philosophers have criticized formal logic for this defect, but it should not be expected to produce that for which it is not fitted and which it never claims to produce. Syllogistic logic is important, not as a method of discovery, but as a means of testing the correctness of the instruments of reasoning.

In the third place, syllogistic logic is limited in its basic principle that every proposition can be included in, or excluded from, a given class. Syllogistic logic deals only with propositions common to large classes of objects. It is limited, therefore, because no inferences can be drawn about the relations of two propositions to each other unless the proposition with which each of them is compared is in both cases the same. Logic errs in considering relations between propositions to be ultimately reducible to relationships between their terms. It deals

wholly with propositions analyzed into subject-predicate relationships, and does not deal with any proposition standing by itself, as an unanalyzed whole, in its relations to any other proposition as a whole.

Syllogistic logic, then, is a limited instrument. It is an instrument for determining the consistency of our ideas and as such is the minimum ground for truth. But it treats knowledge from an atomistic, analytic point of view. It deals solely with the formal operation of the thought processes from the point of view of its parts without taking into consideration wholes which have properties which their parts do not have.

(3) The significance of Hegel in the history of philosophy is that he unites in one system the Aristotelian and Kantian movements in thought. He unites in one system the conclusion arrived at by both the objective movement in Greek philosophy and the subjective movement of modern philosophy - personal consciousness as the highest principle of life. The objective movement, culminating in Plato and Aristotle, arrived at a conception of reality as mind or reason immenant in the world of nature. Modern subjective philosophy arrived at the conclusion (in Kant) that to investigate the pure thought-notions of the mind is to investigate the laws of existence as it is known or knowable in experience.

The philosophy of Hegel recognizes the implications of Kant's critical philosophy as over against the results of Greek ontology, and his philosophy is an attempt to arrive at a synthesis of the essential tendencies and ideals of both Greek and modern thought. His philosophy is the last phase of the one "universal philosophy", and as such is the synthesis of all that is true in previous thought. The contributions of

all previous thinkers have been included in and given new significance in a whole that purports to explain adequately the whole of reality. Growing out of the immediate work of Fichte and Schelling, Hegel completely rejects the concept of the "ding-an-sich", the concept of an Absolute or totality which remains hidden forever, abd begins with the assumption that the forms of cognition are identical with the principles of being. For Hegel, reason and nature cannot be distinguished from one another. In this lies his objection to previous logic, both formal and transcendental, for he conceives that logic should be identified with metaphysics. The chief distinction, then, between the logic of Hegel and syllogistic logic is that Hegel's logic holds the central place of unfolding the method and principles of all thought, both subjective and objective.

The logic of Hegel is the abstract and systematic exposition of the final truth of reality which is discovered in the examination of experience in the Phenomenology. Both works are corelative: the Phenomenology contains the whole of Hegel's system from the point of view of the concrete forms of actual experience; the Logic includes the whole from the point of view of its ultimate form. The presuppositions of the logic are, therefore, to be found in the Phenomenology; the fundamental presupposition being that the ultimate reality, the Absolute, is Mind or Spirit (Geist), and as such is not impersonal being, but a living, self-conscious personality working out his purposes in nature and mind. The entire universe has its ground in the self-unfolding development of the Absolute Reason. Basic to the system are the presuppositions: the true is the whole; the true is concrete, not abstract; the true is a dia-

lectical development, discovered in experience. These are all viewed as elements in the self-unfolding of the Absolute Reason, and appear at every stage of the Logic.

(4) The Hegelian categories, unlike those of Aristotle and Kant, are shown to be logically necessary because all are directly deduced from the simplest, most abstract, and most fundamental category, Being. The categories of Aristotle are not characterized by any principle of deduction, and the categories of Kant were derived from the traditional table of judgments and are considered by him to be complete and exhaustive. Hegel looks upon the categories of both as external predicates applied to reality, and he attempts to deduce his categories in such a way that they are not merely external limits imposed upon reality, but are characterizations of reality which are produced by the necessary self-unfolding of the Absolute Reason. The principle by which this is done is the principle of dialectic, by which each category is seen to be opposed to its other, and thought is forced to harmonize the contradictions in a higher concept. Thought therefore begins with a thesis as opposed to an antithesis, and these contradictory elements are resolved in a higher concept, the synthesis, which becomes a new thesis with entirely new properties and from which the dialectic moves on through a repetition of the process. Three categories, with their sub-categories, are thus deduced by Hegel: Being (immediacy), Essence (external relations), and Concept (internal relations). Each is a necessary element in the self-unfolding of the Absolute Reason. They are not instruments which the mind uses to interpret reality, but elements of a whole in the unity of which the mind

is. The movement in the Logic is to trace the categories logically in the abstract up to the category of the Absolute Idea, or self-consciousness. Thus thought reaches intelligence both as the principle of unity in the world, and also as the empirical process by means of which that principle can be traced out in reality.

(5) A comparison of the two logics shows that they are not as far apart in meaning as is first supposed. Hegelian logic is, however, much more comprehensive than the logic of Aristotle. Hegel's primary objection to syllogistic logic is on the ground that it is inadequate as an expression of the whole truth. But he does not reject it; he recognizes its value and gives it a high place in his own logic. Hegel himself makes a beginning by the use of those fundamental laws of thought which he seems to disparage, and he sees in the syllogism not only the primary form of subjective reasoning, but also an expression of the nature of objective reality as well. His concept of the truth as the whole leads him to emphasize the inadequacy of the older logic, and often makes him appear to deal with it more harshly than it deserves. Several antitheses between the two logics are noted:

(a) Syllogistic logic is a logic of class-inclusion based on similarity including difference. Hegel's is a logic of inclusion based on similarity and difference included in a higher unity. For both logics the principle of mediation is basic, the difference between them being in the method by which mediation is accomplished.

(b) Syllogistic logic is atomistic and analytic, and deals with external relations. Hegel's logic is organic and synoptic, and med-

iation involves internal relations characteristic of thought itself.

(c) Both logics are abstract, but both have a reference to real existence. Their difference lies in a difference of approach.

(d) The two logics differ in their criterion of truth. For formal logic, consistency is the criterion; for Hegelian logic, coherence (including consistency) is the criterion. Aristotle's logic is static and lifeless; Hegel's logic is organic and dynamic, characterized by the evolution and development of thought.

(e) The emphasis is Aristotelian logic is upon wholes as classes; in Hegelian logic the emphasis is upon organic wholes. As such, it includes reference to the properties of wholes which their parts do not have - a reference made in formal logic only in connection with the fallacy of composition and division.

The over-all emphasis of Hegelian logic is upon the principle, <u>the true is the whole</u>, and the assertion that only a view as comprehensive as possible can give us the truth about any object.

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